## United States Air Force

# Soil Vapor Extraction at the Jet Engine Buildup Shop



Loring Air Force Base

STARTUP REPORT

DRAFT

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

May 1999

20000818 029

## **Loring Air Force Base**

# SOIL VAPOR EXTRACTION AT THE JET ENGINE BUILDUP SHOP

## STARTUP REPORT

## **DRAFT**

Prepared for:
Department of the Air Force
Air Force Center for Environmental Excellence (AFCEE)
Brooks Air Force Base, Texas 78235-5328

Prepared by:
Bechtel Environmental, Inc.
151 Lafayette Drive
Oak Ridge, Tennessee 37830

Contract No. F41624-94-D-8072 Job No. 22784

May 1999

Revision B

Prepared Jeff N. Dis for Eric Berglund	5/18/99
Approved	5/10 000
Bechtel Project Engineer	Date
Approved ————————————————————————————————————	5/18/99
Bechtel Project Manager	Date

## **CONTENTS**

		Page
FIG	URES	iii
TAI	BLES	iii
ACI	RONYMS AND INITIALISMS	iv
	ITS OF MEASURE	
	INTRODUCTION	
	SITE BACKGROUND	
	2.1 SITE DESCRIPTION AND BACKGROUND	1
	2.2 NATURE AND EXTENT OF CONTAMINATION	4
	2.3 REGULATORY SETTING	4
	2.4 CLEANUP CRITERIA	
3.0	CHRONOLOGY OF EVENTS	4
4.0	SOIL SAMPLING	6
	SYSTEM INSTALLATION	
	5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION	9
	5.2 BLOWER SYSTEM	10
	5.3 EMISSIONS EQUIPMENT	10
	5.4 PIPING	10
	5.5 SURFACE SEAL	
5.0 \$	STARTUP	12
,	6.1 PRE-STARTUP CHECKOUT	12
(	6.2 PRE-STARTUP TESTING	12
(	6.4 STARTUP	12
	6.4.1 Air Extraction Well Data	12
	6.4.2 Monitoring Point Data	15
	6.4.3 SVE Blower System Data	15
	6.4.4 Emission Data	19
	6.4.5 Groundwater Management	19
	SUMMARY	
3.0 F	RECOMMENDATIONS	22
	ERENCES	23

THIS PAGE IS MISSING IN ORIGINAL **DOCUMENT** 

## ACRONYMS AND INITIALISMS

AEW air extraction well AFB Air Force Base

AFBCA Air Force Base Conversion Agency

AFCEE Air Force Center for Environmental Excellence

AIW air injection well

ARAR applicable or relevant and appropriate requirements

BEI Bechtel Environmental, Inc.

bgs below ground surface

EE/CA Engineering Evaluation/Cost Analysis
EPA U.S. Environmental Protection Agency

ES Entomology Shop
JEBS Jet Engine Buildup Shop

MP monitoring point

MDEP Maine Department of Environmental Protection

PAV passive air vent

PRG photo ionization detector preliminary remediation goal

PVC polyvinyl chloride

RAWP Removal Action Work Plan

SVE soil vapor extraction TCE trichloroethene

TVOC total volatile organic compounds

## UNITS OF MEASURE

cfm cubic feet per minute

in. inch/inches
in H<sub>2</sub>0 inches of water
in. Hg inches of mercury

ft feet

ft² square feet
gal gallon
kg kilogram
lbs pounds
μg microgram
ppm parts per million

ppmv parts per million (volume basis)

rpm revolutions per minute

scfm standard cubic feet per minute

yd<sup>3</sup> cubic yard

## 1.0 INTRODUCTION

The Air Force intends to perform removal actions of contaminated surface and subsurface soil at Loring Air Force Base (AFB) in Limestone, Maine. These removal actions will comply with a Federal Facilities Agreement between Region I U.S. Environmental Protection Agency (EPA), the Maine Department of Environmental Protection (MDEP), and the U.S. Air Force signed on January 30, 1991. Bechtel Environmental, Inc. (BEI) has been contracted by the Air Force Center for Environmental Excellence (AFCEE) as the removal action contractor for Loring AFB under Prime Contract No. F41624-94-D-8072.

This startup report documents the construction and startup (first month of operation) of a Soil Vapor Extraction (SVE) system at the Jet Engine Buildup Shop (JEBS). The SVE system will provide subsurface remediation for the area contaminated with trichloroethene (TCE). The system includes blower/vacuum unit, SVE wells, monitoring points (MPs), and piping.

## 2.0 SITE BACKGROUND

## 2.1 SITE DESCRIPTION AND BACKGROUND

Loring AFB is located in Aroostook County in the northeastern corner of Maine about 3 miles from the Canadian border (see Figure 2-1). The base occupies about 9,000 acres near the town of Limestone, Maine. The base was constructed between 1946 and 1953, and improvements were made throughout its operational life. Most recently, the base was part of the Air Combat Command. On September 30, 1994, Loring AFB was officially closed and is now the responsibility of the Air Force Base Conversion Agency (AFBCA). The JEBS site is located west of the flightline in the south-central industrial area of the Base (Figure 2-2).

The geology of the Loring site consists of overburden soils containing glacial till and reworked glacial till that have been used as fill materials. The thickness of the soils is variable between the different operable units but is generally between 10 and 30 ft thick. Bedrock at the site is a well-cemented, highly fractured, weathered limestone of the Carys Mills Formation that generally dips to the west (URS 1995).

Groundwater at the JEBS is present in both the overburden and the bedrock. Groundwater in the overburden is generally unconfined, discontinuous, and often perched. The depth to groundwater in the overburden is generally about 10 to 20 ft below ground surface (bgs). Groundwater flow direction within the overburden appears to be predominantly to the south-southwest. Groundwater in the bedrock primarily occurs in the secondary porosity features such as fractures and bedding planes. Groundwater in the bedrock aquifer is under unconfined to semiconfined conditions and groundwater flow is controlled by fracture orientation, which primarily trends northeast and northwest. Vertical flow in the bedrock aquifer is generally upward (URS 1995).

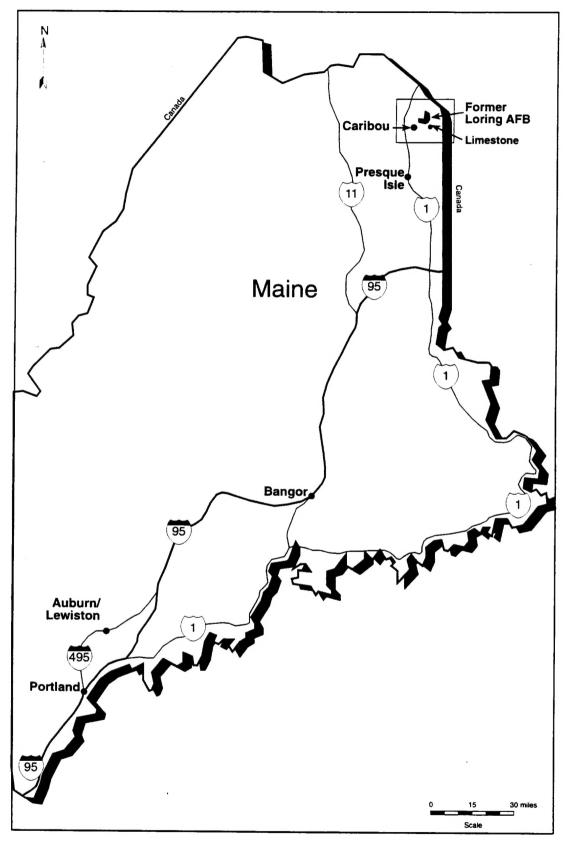


Figure 2-1 Loring Air Force Base Location Map

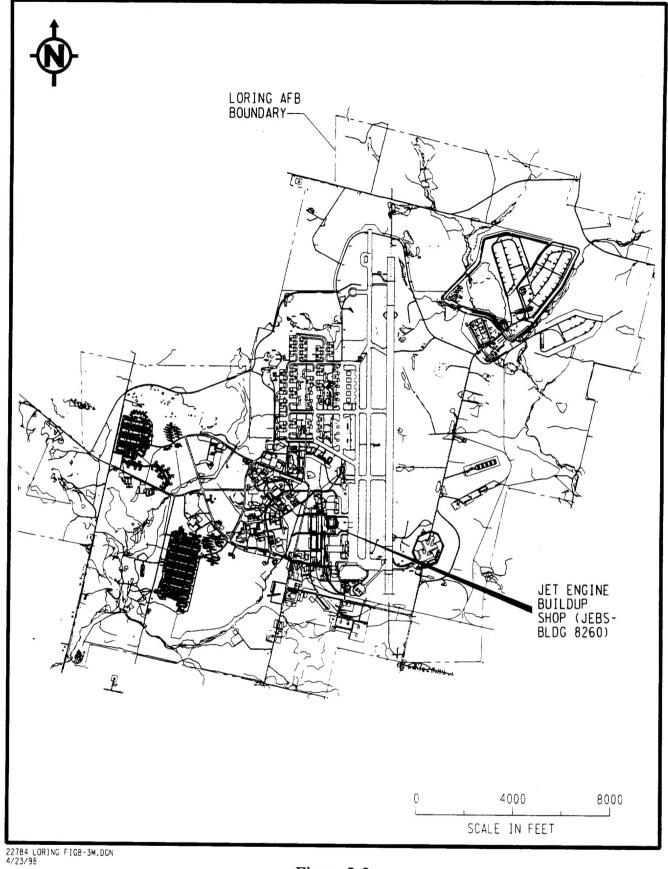


Figure 2-2 Loring Air Force Base

## 2.2 NATURE AND EXTENT OF CONTAMINATION

TCE has been detected at the JEBS site at concentrations that may impact groundwater to levels above regulatory criteria [Engineering Evaluation/Cost Analysis (EE/CA) for JEBS and Building 8710, Bechtel 1998a]. As the primary contaminant of concern, TCE defines the limits of the removal action. TCE concentrations at the North, South and Southeast JEBS areas are shown on Figure 2-3. The volume of soil to be remediated was calculated in the EE/CA to be 49,665 yd<sup>3</sup> and the amount of TCE in that soil was calculated using arithmetic means of soil TCE concentrations to be 819 lbs.

## 2.3 REGULATORY SETTING

The removal actions being performed at Loring AFB are authorized under the Comprehensive Environmental Response, Compensation, and Liability Act, Section 104. The removal action design is based on the EE/CA. The EE/CA presents a complete discussion of applicable or relevant and appropriate requirements (ARARs) for this removal action. These ARARs were incorporated into the design and planning of the JEBS site action.

## 2.4 CLEANUP CRITERIA

The EE/CA presented broad removal action objectives that would prevent leachate generated from soil contaminated in excess of the preliminary remediation goal (PRGs) from migrating to groundwater at concentrations greater than ARARs. Specific performance objectives presented in the EE/CA are as follows:

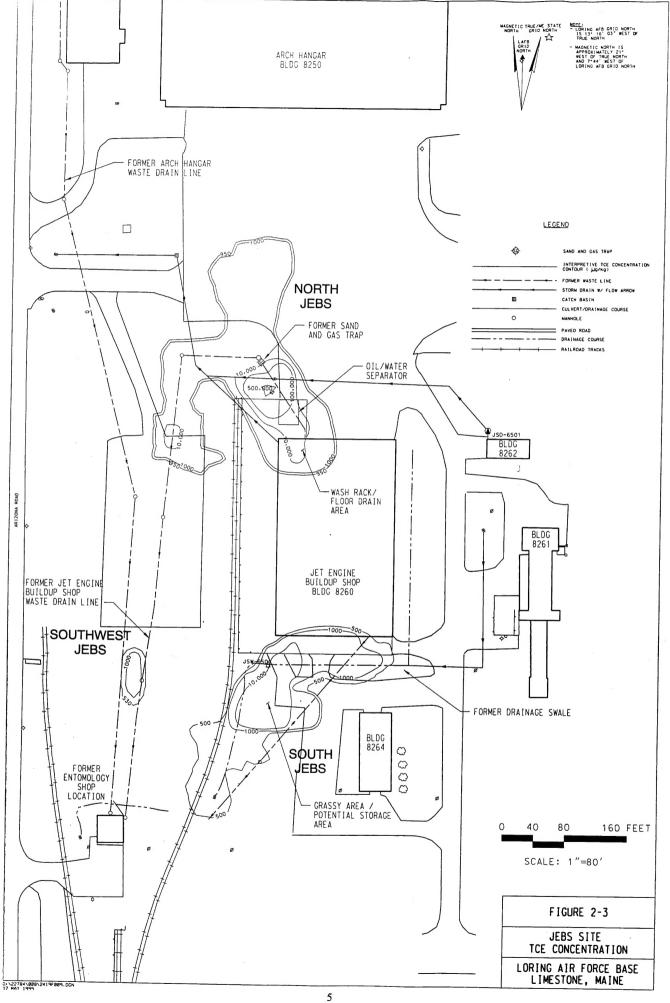
Treat contaminated soil for TCE using an in situ SVE process to an action level of:

- 950 μg/kg at the North JEBS area
- 500 μg/kg at the South JEBS area
- 530 μg/kg at the Southwest JEBS area

## 3.0 CHRONOLOGY OF EVENTS

The following presents the chronology of events involved in the construction and startup of the JEBS SVE system:

DATE	EVENT
8/27/98	Geoprobe sampling to delineate extent of contamination
8/31-9/14/98	Construct air extraction and passive wells and MPs



DATE	EVENT
9/4/98	Geoprobe sampling to delineate extent of contamination inside south end of JEBS building
9/26-27/98	Construct well head and service loop manifolds
9/27-10/22/98	Construct piping to connect SVE wells
10/19/98	SVE equipment inspection at subcontractors plant (Appendix C)
10/22/98	Move biovent equipment from Entomology Shop (ES) biovent building to Nose Dock 28 for storage and convert building to JEBS SVE system service building
10/26/98	Process equipment delivered and installed in service building
10/27/98	Hook well head piping to system blower
10/27/98	Electrical hookup of system
10/30/98	Obtain background data total volatile organic compounds (TVOC) from air extraction wells (AEWs)
11/2/98	System startup begins (30 day startup period)
12/2/98	Begin normal operation and maintenance period

## 4.0 SOIL SAMPLING

Prior to construction, BEI was requested by the Air Force to confirm that the aerial extent of contamination had been determined and that contamination did not extend beneath the south end for the JEBS building. Geoprobe sampling was performed at 10 locations (Figure 4-1) in accordance with Soil Vapor Extraction at the Jet Engine Buildup Shop, Removal Action Work Plan, Final (Bechtel 1998b). Borehole logs and headspace results are included in Appendix A. Laboratory analysis results are presented in Table 4-1. No system design changes were indicated by the sampling results from perimeter borings PB-1 to PB-8 since no cleanup levels were exceeded. The detection limits for samples collected from perimeter borings PB-9 and PB-10 are higher than the action level in that area. Those sample locations are within the area of influence of system. No additional action is recommended at this time.

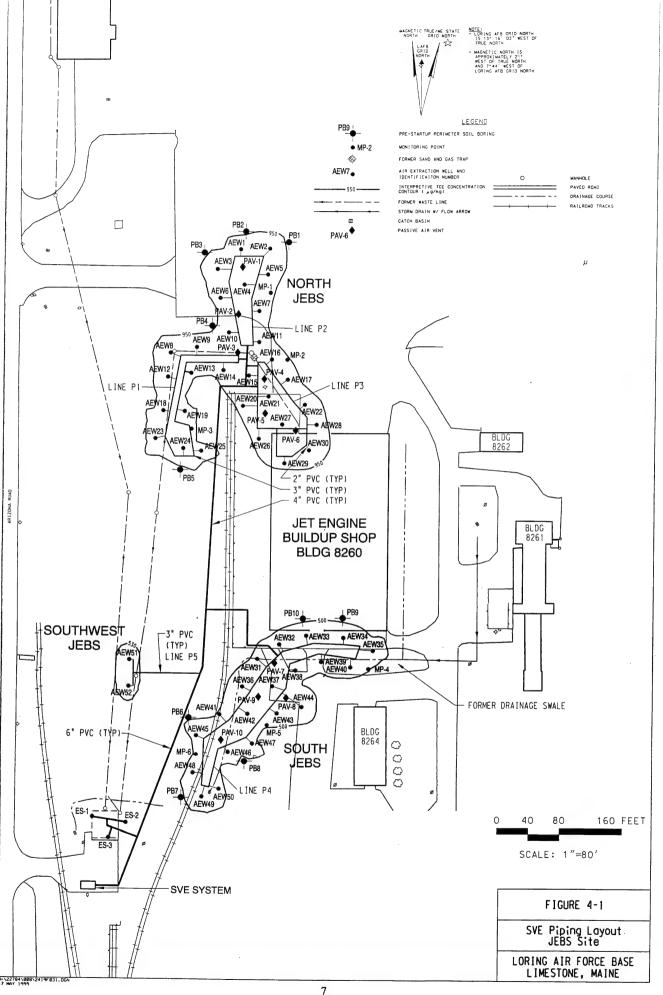


Table 4-1 JEBS Soil Sampling Analytical Results

BORING	SAMPLE DEPTH (ft)	DETECTION LIMIT ug/kg	TCE CONCENTRATION ug/kg	ACTION LEVEL ug/kg
PB-1	16-17	220	280	950
PB-2	18-20	190	300	950
PB-3	16-18	190	250	950
PB-4	16-17	220	860	950
PB-5	14-16	220	non detect	950
PB-6	14.5-16	200	non detect	500
PB-7	11-12	190	non detect	500
PB-8	12-14	160	non detect	500
PB-9	16-16.5	920	non detect	500
PB-10	11-12.5	950	non detect	500

## 5.0 SYSTEM INSTALLATION

The SVE system consists of 55 AEWs, 10 passive air vents (PAVs), 12 MPs, piping, and blower/vacuum system. Three of the AEWs are converted biovent air injection wells (AIW) previously installed at the former ES biovent system. These were added to the SVE system to complete cleanup of TCE contamination at this site.

## 5.1 AIR EXTRACTION WELL AND MONITORING POINT INSTALLATION

The AEWS, PAVs, and MPs were installed by a drilling subcontractor as the initial step in construction of the SVE system. Wellhead units were assembled and installed by the BEI field staff. All activities were supervised by a BEI onsite geologist who recorded the drilling activities and subsurface information in a logbook. Boring logs and well completion reports of each AEW, PAV, and MP installed are provided in Appendix B. Well and MP locations are shown on Figure 4-1.

The AEWs were installed as specified in the Soil Vapor Extraction at the JEBS Removal Action Work Plan (Bechtel 1998b). Each well was completed, packed with sand around the screened intervals, sealed with a bentonite plug, and grouted with EZmud/Benseal. Above-grade well completion's were installed as specified in the Removal Action Work Plan (RAWP) (Bechtel 1998b).

There were a total of 52 AEWs and 10 PAVs installed over an area of approximately 67,000 ft<sup>2</sup> to depths of 11.2 to 27.0 ft bgs. Two wells were installed inside the JEBS building. Well completions were all above grade mountings, with a 2-in. polyvinyl chloride (PVC) riser and a PVC screened interval at the bottom of each well.

A total of 12 MPs were installed in 6 locations to depths of 7 to 18 ft bgs (see Table 6-3 for installed depths). All MPs were in clusters of two points at one location. The MPs were constructed of 1/4 in. PVC tubing with a 6-in. wire-wrapped stainless steel, slotted screen. Completions are all below-grade mountings.

Three ES biovent AIWs were converted to SVE wells by manifolding them into the JEBS system. These wells will be used to complete remediation of the ES site. Confirmation sampling at this site showed that a small area of TCE contamination remained (Bechtel 1998c). Because biovent AIWs were designed using a radius of influence of 32 ft and SVE wells used a radius of influence of 25 ft, the coverage of the contaminated area by the three converted wells was checked using a radius of influence of 25 ft. This preliminary evaluation indicates that there may be enough overlapping coverage to complete remediation without adding wells, however, additional flow and pressure data from this area under better operating conditions will be required to make a final judgment (high water table limited flow capacity during the start-up period). Action level at the ES is  $540 \,\mu\text{g/kg}$  for TCE.

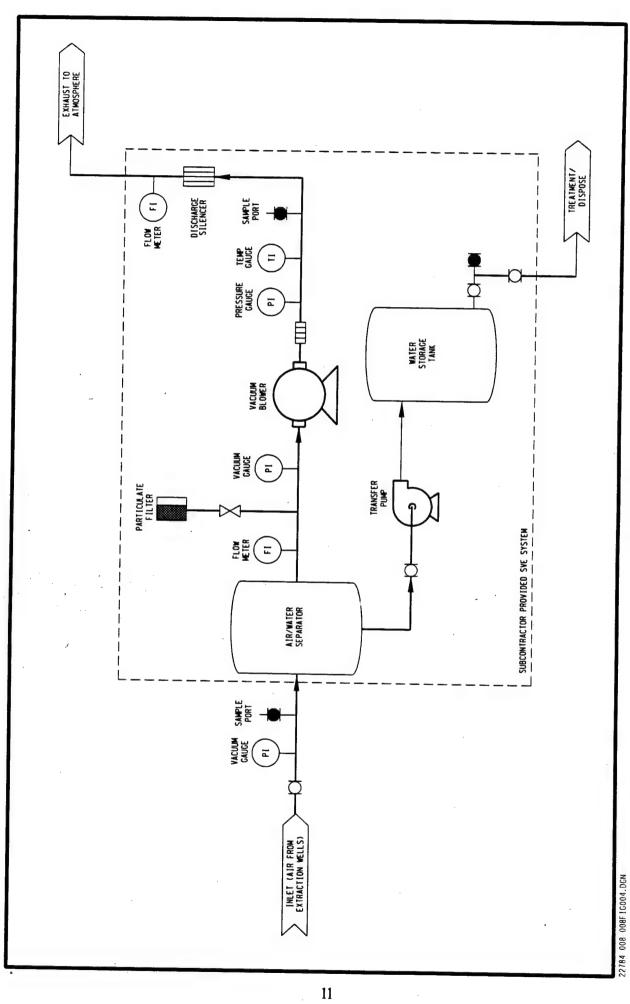


Figure 5-1
Vapor Extraction Diagram
Loring Air Force Base

## 6.0 STARTUP

## 6.1 PRE-STARTUP CHECKOUT

Before startup, a complete system check was performed to verify that the blower system was properly connected to the piping system, proper electrical connections had been made, and blowers and motors were properly lubricated.

## 6.2 PRE-STARTUP TESTING

Before actual operation, the blower system was started to check for air leaks and to ensure that gauges and meters worked properly, and the system delivered the proper flow and vacuum. The system and piping was checked for air leaks with the wells shut off to create maximum vacuum inside the piping.

## 6.3 BASELINE SAMPLING

Baseline sampling of soil gas was performed before the system was started. Soil gas was sampled at each AEW and analyzed for TVOC using field instrumentation. Each well was purged of one well volume of air before sampling. These data are presented in Table 6-1. Baseline sampling was done to provide data on prestartup soil gas contamination levels. These data will be used for comparison to future data obtained under similar static conditions (equilibrium) of the system being shut down. This will provide an indication of how cleanup is progressing.

## 6.4 STARTUP

Startup took place between November 2, 1998 and December 2, 1998. Startup activities were performed to assess and maximize the performance of the SVE system and to determine if emissions controls need to be implemented. The following activities were performed during the system startup period:

- Measure AEW flow rates and vacuums and adjust to meet design where possible
- Measure vacuum in the MPs
- Record blower system performance data including flow and vacuum
- Monitor and quantify vapor emissions
- Management of groundwater drawn into the system during normal operation.

## 6.4.1 Air Extraction Well Data

TVOC data from the AEWs was collected once during the startup period. This data is shown on Table 6-2. These data will be compared to data obtained in a similar manner while the system is running to adjust individual well flows and balance the system. Air extraction well flow and

THIS PAGE IS MISSING IN ORIGINAL DOCUMENT

Table 6-2

AEW Sampling
Total Volatile Organic Compounds

WELL NUMBER	WELL DEPTH (ft from top of valve)	DEPTH TO TOP OF SCREEN (ft from top of valve)	TVOC (ppm)
			11/9/98
AEW-1	18.85	7.85	off
AEW-2	21.90	7.90	16.8
AEW-3	20.75	7.75	off
AEW-4	22.40	7.90	. 32.2
AEW-5	18.90	7.90	3.1
AEW-6	20.50	5.00	4.6
AEW-7	23.45	8.45	5.2
AEW-8	20.35	8.35	8.9
AEW-9	22.15	8.15	37.4
AEW-10	23.15	8.15	40.1
AEW-11	23.60	8.60	26.1
AEW-12	22.15	8.15	15.4
AEW-13	20.70	7.70	42.6
AEW-14	23.05	8.05	169
AEW-15	18.00	8.00	1.7
AEW-16	14.00	8.00	2
AEW-17	20.25	7.75	19.1
AEW-18	17.25	8.25	16.9
AEW-19	20.00	8.00	33.6
AEW-20	22.85	7.85	114
AEW-21	18.90	7.90	
AEW-22	17.65	7.65	1.2
AEW-23	18.10	7.60	2.7
AEW-24	11.15	8.15	36.1
AEW-25	15.30	8.30	73.5
AEW-26	18.00	8.00	off
AEW-27	18.70	7.70	5.6
AEW-28	18.15	7.65	9
AEW-29	18.25	8.25	1.2
AEW-30	20.60	8.60	2.4
AEW-31	21.15	7.65	10:4
AEW-32	20.85	7.85	off
AEW-33	20.35	7.85	3.1
AEW-34	18.80	7.80	41.2
AEW-35	20.35	7.85	25.2
AEW-36	18.60	7.60	61.2
AEW-37	23.45	8.45	32.5
AEW-38	22.85	8.85	92.4
AEW-39	27.00	12.00	35
AEW-40	20.70	7.70	45.1
AEW-41	19.65	7.65	36.1
AEW-42	14.85	7.69	49.1
AEW-43	24.20	9.20	21.2
AEW-44	23.00	8.50	61.6
AEW-45	18.85	7.85	3
AEW-46	19.15	8.15	off
AEW-47	23.15	8.15	17
AEW-48	19.06	8.05	3.1
AEW-49	19.10	7.60	off
AEW-50	18.35	7.85	off
AEW-51	23.75	8.75	off
AEW-52	23.40	8.40	10.2
ES-1(AIW-2)	17.45		off
	14.90	12.45	off
ES-2(AIW-3)		9.90	28.3

# Table 6-3 SVE Well Flow and Vacuum Data

WELL	WELL	<b>DEPTH TO</b>	11/6	11/6/98	11/9/98	86/6	11/13/98	3/98	11/1	11/17/98	11/1	11/19/98	11/2	11/23/98	11/30/98	86/0
NUMBER	(ft from tov1)	SCREEN (ft from tov1)														2
			VACUUM (in H,O)	FLOW (scfm)	VACUUM (in H,O)	FLOW (scfm)	VACUUM	FLOW (scrfm)	VACUUM	FLOW	VACUUM	FLOW	VACUUM	FLOW	VACUUM	FLOW
AEW-1	18.85	7.85	Note 2	0		2.9	off-	0	off-	0	off-	O	Off-	(scim)	(in H <sub>2</sub> O)	Sch
0 7012.4	3						water		water		water	,	water	•	water	>
AEW-2	21.90	06.7		10.7		9.6	5	0	5	13.9	2	1.5	0.3	0	29	19.1
AEW-3	20.75	7.75	off-	0	off-	0	off-	0	off-	0	off-	0	-JJo	0	-JJo	0
AEW-4	22.40	7.90	Mate	12.7	Walti	9	water	c	water		water		water	,	water	-
AEW-5	18.90	7.90		11.7		9.6	2.8	0	frozen		frozen	0	frozen	0	4.2	13.6
AEW-6	20.50	5.00		8.4		9.5	5	0	frozen	0	frozen		frozen	0	nezen	٥
AEW-7	23.45	8.45		11.5		12.1	2	12.7	4.7	13.1	2.5	14.2	23	16.3	3.8	7 2
AEW-8	20.35	8.35		1		11.5	2	4.3	29.5	5.8	49	15.3	0.7	200	2.0	4.5
AEW-9	22.15	8.15		12.4		13.9	9	0	26	13.4	27	13.1	0.69	0	34	5
AEW-10	23.15	8.15		11.9		10.4	2	0	29	13.2	32	15.2	2.2	5.4	33	12 B
AEW-11	23.60	8.60		12		8.8	5	9.4	frozen	10.3	5	15.6	2.3	8	4.3	13.7
AEW-12	22.15	8.15		10.9		8.9	1.1	0	1.3	0	frozen	0	frozen	0	frozen	
AEW-13	20.70	7.70		10.3		12.3	-JJo	0	off-	0	off-	0	off-	0	off-	
******	10.00			,			water		water		water		water		water	)
ACW-14	23.05	8.05		3./		2	9	0	frozen	3.1	20	7.7	0.19	0	34	0
AEW-15	18.00	8.00		10.2		11.2	ري د	6.4	off-	0	off-	0	off.	0	off-	0
A CIAL AC	71.00	000		,					water		water		water		water	
AEW-10	14.00	8.00		E		13	5.5	3.3	30	11.5	44	9.8	0	0	33	11.1
AEW-I	20.02	67.7		19.1		9.01	4.6	13.6	2	12.6	1.6	10.1	0.94	7.5	frozen	0
AEW-10	67.71	8.25		0		0	9	0	සි	0	off- water	0	frozen	0	frozen	0
AEW-19	20.00	8.00		9.3	-	12.7	2.5	10.5	3.8	10.4	2	10.5	0.7	11.3	frozen	c
AEW-20	22.85	7.85		9.2		11.4	2.6	11.6	5	12.3	1.7	10.8	-	8.8	27	16.3
AEW-21	18.90	7.90		10.7		8.9	0.02	0	frozen	0	broken	0	broken	0	broken	0
AEW-22	17.65	7.65		2		11.7	5.5	10.2	2.7	8.8	0.65	4.2	0.98	7.8	frozen	0
AEW-Z3	18.10	7.60		0		9.5	off- water	0	off- water	0	off- water	0	off- water	0	off-	0
AEW-24	11.15	8.15		0		3.5	9	10.9	frozen	25.3	43	9	0.7	0	frozon	
AEW-25	15.30	8.30	off- water	0	off- water	0	off- water	0	off- water	0	off-	0	off-	0	off-	
AEW-26	18.00	8.00		0		2.5	4.5	7.2	26	c	17	3.4	water	45	water	c
AEW-27	18.70	7.70		11.3		9.6	4.5	9.8	frozen	0	frozen	50	frozen	20	hroken	5 0
AEW-28	18.15	7.65		1		12.4	2.8	0	frozen	0	frozen	0	frozen	0	frozen	0

16

Table 6-4 **Monitoring Point Data** 

Monitoring Point Number	Depth to Bottom of Screen (ft)		euum f H <sub>2</sub> 0)
		<u>11-13-98</u>	12-1-98
MP-1-7	7	.08	0
MP-1-17	17	.82	.66
MP-2-7	7	.91	0
MP-2-10	10	.90	.90
MP-3-7	7	.90	.90
MP-3-16	16	.61	.58
MP-4-7	7	0	0
MP-4-16	16	.90 .84	
MP-5-7	7	.09	0
MP-5-18	18	1.00	.82
MP-6-7	7	0	0
MP-6-13	13	4.60	4.30

Table 6-5 **System Flow** 

Date	Total Influent Flow (scfm) <sup>1</sup>	Total Effluent Flow (scfm) <sup>2</sup>
11-6-98	362	860
11-7-98	360	860
11-9-98	360	860
11-18-98	. 282	860
11-25-98	101	860
11-30-98	215	860
12-2-98	215	860

Total flow calculated from individual well measurements.

Flow = velocity × cross-section area. Velocity measured with a hot wire anemometer.

# Table 6-6 Emissions Data

		1	2	3	4	5	6	7	8
							Non-ideal		
	Number of Air	Effluent	Effluent TCE		Effluent		volume @	mg TCE	
	Extraction Well In	Level PID -	Concentration -	System Effluent	Temperature,	Effluent	temp. and	/m3 per	TCE Emission,
Date Sampled	Operation	ppmv	ppmv	Flow, acfm	С	Pressure, atm	pressure	ppmv	lbs/day
11/9/1998	39	15	33	860	60	1.01	27	5.61	14.28
11/13/1998	25	40	96	860	60	1.01	27	5.61	41.55
11/25/1998	14	6.5	37	860	60	1.01	27	5.61	16.02
12/2/1998	17	5.3	15	860	60	1.01	27	5.61	6.49

### Notes

Column 1: vapor volatile organic concentration measured at SVE blower discharge by photoionization detector (PID) in parts per million on a volume basis (ppmv)

Column 2: vapor volatile organic concentration measured at SVE blower discharge

by analytical laboratory in parts per million on a volume basis (ppmv)

Column 3: SVE effluent flow - measured by hot wire anemometer

Column 4: SVE effluent flow temperature in degrees C

Column 5: SVE effluent pressure in psi

Column 6: molar volume of gas, calculated as follows:

Molecular weight of TCE =  $151.5 \times 10^3$ 

$$v = \frac{nRT}{p}$$

where

v = liters of gas per mole @ temperature and pressure

n = number of moles

T = temperature, degrees K

p = pressure, atm

R =0.0821 L-atm/mol-K

Column 7: Conversion factor for ppmv to mg/m3 as follows:

$$\frac{1ppmv}{TCE} = \frac{1moleTCE}{10^6 moleair@333K;1.01atm} = \frac{151.5x10^3TCE}{10^6 (Column\_6x10^{-3})}$$

Column 8: pounds per day TCE emitted calculated as follows:

$$\frac{lbs}{day} = Column_3 \left(\frac{ft^3}{min}\right) x Column_2 \left(\frac{mm}{2}\right) x Column_3 \left(\frac{mg}{m^3}\right) x Column_3 \left(\frac{kg}{m^3}\right) x Column_3 \left(\frac{kg}{m^3}\right) x Column_3 \left(\frac{kg}{min}\right) x Co$$

## Example Calculation (for 11/9/98 data):

## 1. Molar volume:

$$v = \frac{1' \mod(0.0821)(333K)}{1.01 \mod m}$$

v = 27 L

## 2. Convert ppmv to mg/m3:

$$\frac{1\_ppmv}{TCE} = \frac{151.5x10^3}{10^6(27x10^{-3}m^3)}$$

$$1 \text{ ppmv} = 5.61 \text{ mg-TCE/m}3$$

## 3. Calculate TCE emissions, lbs/day:

$$\frac{lbs}{day} = 860 \left(\frac{ft^3}{\min}\right) x33 (ppmv) x \frac{m^3}{35.31 ft^3} x5.61 \left(\frac{mg}{m^3} per - ppmv\right) x \left(\frac{kg}{10^6 mg}\right) x2.2 \frac{lbs}{kg} x1440 \frac{\min}{day}$$

lbs/day = 14.28

## 8.0 RECOMMENDATIONS

- 1. If the number of wells allowing flow remains at a low level, shut the system down for the rest of the winter months and restart in the spring.
- 2. When more wells become operational (in the spring), monitor groundwater levels on a more frequent basis to determine if the perched zones can be dried out and maintained relatively dry by the SVE system.
- 3. Continuing evaluation of the system operation during normal operations.
- 4. Evaluate the need for a full or partial surface seal during the summer of 1999.
- 5. Evaluate effluent sampling methods to assure accurate determination of effluent rates and prediction of cleanup times

## REFERENCES

- Bechtel (Bechtel Environmental, Inc.), 1998a. Engineering Evaluation/Cost Analysis (EE/CA), Jet Engine Buildup Shop and Building 8710, Final. July.
- Bechtel, 1998b. Soil Vapor Extraction at the Jet Engine Buildup Shop, Removal Action Work Plan, Final. August.
- Bechtel, 1998c, Biovent Sites confirmation Sampling Field /Laboratory Results and Recommendations, Draft December
- Buscheck, T.E. and T.R. Peargin, 1991. Summary of a Nation-Wide Extraction System Performance Study. In Proceedings of the 1991 Petroleum Hydrocarbons and Organic Chemicals in Ground Water Prevention, Detection, and Restoration.
- URS (URS Consultants, Inc.), 1995. Engineering Evaluation/Cost Analysis for OUs 5, 8, 9, 10, and 11. March.

## APPENDIX A

PRESTARTUP PERIMETER SOIL BORINGS BOREHOLE LOGS AND HEADSPACE SCREENING

Project Name: Loring AFB	<del></del>			15	
Project Number: 22784	Flores	i	TBD	Borehole No.: PBH-1	
Location: JEBS					
Driller: Patrick St. Peter and Sons	Date Started: 8/27/98   Date Completed: 8/27/9  Total Depth (ft): 17				
Equipment: Geoprobe					
Drilling Method: Drive/Hammer	Depth to Bedrock (ft): 17 Hole Diameter (in): 3				
Drilling Fluid: None			1 /	3	
Completion: Completed as Perimeter Borehole		to Wate		7	
Simple della Completed as Ferminetel Boleriole	Logge	а ву: Р.	Liniey	Geo-probe Macro-sampler	
				is 4ft in length	
Description (f)	Sample Number	Sample Type	Hnu Reading	Comments	
0-0.33ft: Asphalt	1	Macro-	0	0-2ft: Refusal with geo-	
0.33-4ft: Fill - Sandy Gravel: (GM), White (N9) to dk gry (N3), fine to v coarse, unconsid, poorly sorted, subang to subrd. 4-7ft: Fill - Sandy Gravel: (GM), As above.  7-8ft: Gravelly Silty Clay: (CL), Mod yel brn (10YR5/4) to mod brn (5YR3/4), V fine to fine, unconsid, poorly sorted, subang to subrd, wet.	2	sampler Macro- sampler	0	probe sampler, relocate approx. 2ft west. 0-2ft: Refusal with geoprobe sampler, relocate approx. 2ft east of original location.	
108-10.5ft: Gravelly Silty Clay: (CL), As above. 10.5-12ft: Gravelly Silty Clay: (CL), As above. 12-13ft: Gravelly Silty Clay: (CL), As above. 13-13.5ft: Gravell lens. 13.5-14ft: Gravelly Clayey Silt: (ML), Mod yel brn (10YR5/4) to Pale yel brn (10YR6/2), V fine to fine, semi-consld, poorly sorted, subang to subrd, moist.	3 4 5	Macro- sampler Macro- sampler	0	Refusal at 10.5ft - no bdrk, relocate approx. 1ft north of borehole location.	
14-16ft: <b>Gravelly Silty Clay:</b> (CL), Mod yel brn (10YR5/4), V fine to fine, unconsid, poorly sorted, subang to subrd.	6	Macro- sampler	0		
16-17ft: <b>Gravelly Silty Clay:</b> (CL), As above, gravel fraction increase to 30%.	7	Macro- sampler		Sample collected for off- site Laboratory analysis. sample number:LO19123	

Proiect	Name: Loring AFB					
	Number: 22784	[Fla. 1 = 4			Borehole No.: AEW-12	
	nr: JEBS	Elevat		TBD		
	Great Works Drilling	Date S	tarted:8	/31/98	Date Completed: 8/31/98	
	nent: Mobile B59	Total Depth (ft): 19				
	Method: Hollow Stem Auger	Depth	Depth to Bedrock (ft): 19			
	Fluid: None	Hole Diameter (in): 8				
	etion: Completed as a Soil Vapor Extraction Well		to Water		TBD	
	See Construction Log for details	Logged	d By: P.	Linley		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
5   8 10   15   15	O-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsided poorly sorted, subang to subrd, gvl 5-6 inches in diameter.  Office Moist.  Office Cobble zone.  Office Bedrock: Limestone.				No samples required to be collected during installation	

Project Name: Loring AFB				Borehole No : DBU 2		
Project Number: 22784	Borehole No.: PBH-3 Elevation: TBD					
Location: JEBS	Date Started:8/27/98   Date Completed: 8/27/98					
Driller: Patrick St. Peter and Sons	Total Depth (ft): 20					
Equipment: Geoprobe		to Bedro				
Drilling Method: Drive/Hammer		iameter	_ ` /	2		
Drilling Fluid: None		to Water		7.5		
Completion: Completed as Perimeter Borehole		By: P.	1 /			
Districted as 1 on motor Baranate	Logget					
Description (#)	Sample Number	Sample Type	Hnu Reading	Comments		
0-0.33ft: Asphalt	1	Масго-	0	The Geo-probe Macro-		
0.33-4ft: <b>Fill - Sandy Gravel:</b> (GM), White (N9) to dk gry (N3), fine to v coarse, unconsld, poorly sorted, subang to subrd.  4-7.5ft: <b>Fill - Sandy Gravel:</b> (GM), As above.	2	sampler Macro-	0	sampler is 4ft in length.		
7.5-8ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), Olive gry (5Y4/1) to mod yel brn (10YR5/4), v fine to fine, unconsld, poorly sorted, subang to subrd, moist.  8-12ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), As above, moist.  12-16ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), As above, at 15ft - gravel lense 8 inches thick, moist.	3	Macro- sampler Macro- sampler	0			
16-18ft: Gravelly Clayey Silt: (ML), As above, moist.  18-20ft: Gravelly Clayey Silt: (ML), As above, moist.	5	Macro- sampler Macro- sampler	-	Sample collected for off- site laboratory analysis Sample number:LO19124		

Projec	t Name: Loring AFB				Borehole No.: PBH-4		
	t Number: 22784	Elevation: TBD					
	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98					
Driller:	Patrick St. Peter and Sons	Total Depth (ft): 17.5					
Equipr	nent: Geoprobe		to Bedro				
	Method: Drive/Hammer		iameter		2		
	Fluid: None	<del></del>	to Water		8		
	etion: Completed as Perimeter Borehole		d By: P.				
		33	- <b>- ,</b>				
			1 0				
			Sample Type	Reading			
Depth (ft)	Description	ا م	H	ea	Comments		
<del>[</del>		교환	<u>ē</u>	R	Comments		
De		Sample Number	San	Hu			
	0-4ft: Gravelly Clayey Silt: (ML), Dk yel org	1	Macro-	0	The Geo-probe Macro-		
-	(10YR6/6) to dk yel brn (10YR4/2), v fine to fine,	1	sampler	`	sampler is 4ft in length.		
-	unconsid, poorly sorted, subang to subrd.	1			Complete to the lift to right.		
_	4-8ft: Gravelly Clayey Silt: (ML), Mod brn	2	Macro-	٥			
5	(5YR4/4-3/4) to olive gry (5Y4/1), As above, gvl	1 -	sampler				
	to 2 inches in dia., gvl frac 15-20%.	1					
	_				İ		
	8-10ft: Gravelly Clayey Silt: (ML), Olive gry	3	Macro-	0			
	(5Y4/1) to It olive gry (5Y6/1), As above, moist.	1	sampler				
10	10-12ft: Gravelly Clayey Silt: (ML), As above,	4	Macro-	0			
	10.5-11.5ft - gravel lense., moist.		sampler				
	12-14ft: Gravelly Clayey Silt: (ML), As above,	5	Macro-	0			
	moist.		sampler				
	14-15.8ft: Gravelly Clayey Silt: (ML), As above,	6	Macro-	0			
15	moist.		sampler				
	15.8-16ft: Gravelly Silty Clay: (CL), Olive gry						
	(5Y4/1) to It olive gry (5Y6/1), v fine to fine, poorly						
	sorted, unconsid, subang to subrd, moist.						
	16-17.5ft: Gravelly Clayey Silt: (ML), Lt olive	7	Macro-	0	Sample collected for off-		
20	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine,		sampler		site laboratory analysis.		
	unconsld, poorly sorted, subang to subrd, moist.				Sample number:LO19117		
	_						
25	_						
	_						
	٦				İ		
	7						
30							
	7						
	٦						
	٦			Ì			

Projec	t Name: Loring AFB				Borehole No.: PBH-5		
Projec	t Number: 22784	Elevation: TBD					
Locati	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98					
Driller.	Patrick St. Peter and Sons	Total D	16				
Equip	ment: Geoprobe	Depth t	o Bedro	ck (ft):	16		
Drilling	g Method: Drive/Hammer	Hole D	iameter (	(in):	2		
Drilling	g Fluid: None	Depth t	o Water	(ft):	5		
Comp	letion: Completed as Perimeter Borehole	Logged	By: P.	Linley			
			e d	Вu			
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments		
	0-4ft: Gravelly Clayey Sandy Silt: (ML), Olive	1	Macro-	0	The Geo-probe Macro-		
	gry (5Y4/1) to It olive gry (5Y6/1), v fine to coarse, unconsld, poorly sorted, subang to subrd, moist, gvl frac 35+% and up to 2 inches in diameter.		sampler		sampler is 4ft in length.		
5_	4-8ft: <b>Gravelly Clayey Silt:</b> (ML), Lt brn (5YR5/6) to olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsld, poorly sorted, subang to subrd, wet at 5ft.	2	Macro- sampler	0			
10_	8-10ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), As above, moist.	3	Macro- sampler	0			
_	10-12ft: <b>Gravelly Clayey Silt:</b> (ML), As above, moist.	4	Macro- sampler	0			
	12-14ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), As above, at 13.5-14ft gvl lense, v moist.	5	Macro- sampler	0			
15_	14-16ft: <b>Gravelly Clayey Silt:</b> (ML), As above,	6	Macro-	0	Sample collected for off-		
_	moist.		sampler		site laboratory analysis.		
_				-	Sample number:LO19116		
_							
١ _							
20	<u> </u>						
_					·		
_	_						
_	_						
	_				,		
25_							
_							
_	_						
_	-						
20-							
30_	-						
-	†						
_	−						
-	1 . – – – – – – – – – – – – – – – – – –						
			l		<u> </u>		

Projec	t Name: Loring AFB	Ī		·····	Borehole No.: PBH-6			
	t Number: 22784	Elevation: TBD						
Location	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98						
Driller:	Patrick St. Peter and Sons	Total Depth (ft): 16						
Equipr	ment: Geoprobe	Depth i	Depth to Bedrock (ft): 16					
Drilling	Method: Drive/Hammer	Hole D	iameter	(in):	2			
Drilling	Fluid: None	Depth t	o Water	(ft):	6			
Compl	etion: Completed as Perimeter Borehole	Logged	By: P.	Linley				
			be	Reading				
Œ	Docariation	a. L	Sample Type	ag	0			
Ę	Description	ple	릴	&	Comments			
Depth (ft)		Sample Number	am	H				
	0-4ft: Gravelly Clayey Silt: (ML), Dk yel org	<u> </u>	Macro-	0	The Geo-probe Macro-			
-	(10YR6/6) to mod yel brn (10YR5/4) to it olive gry	'	sampler	"	sampler is 4ft in length.			
· -	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid		Jampier		dampior is the inferigul.			
-	poorly sorted, subang to subrd, moist.							
5	4-8ft: Gravelly Clayey Silt: (ML), Lt olive gry	2	Macro-	٥				
-	(5Y6/1) to olive gry (5Y4/1), as above, moist.	_	sampler					
-			Jampier					
_	8-10ft: Gravelly Clayey Silt: (ML), As above,	3	Macro-	0				
	moist.		sampler	ľ				
10	10-12ft: Gravelly Clayey Silt: (ML), As above,	4	Macro-	0				
_	moist.		sampler					
	12-14.5ft: Gravelly Clayey Silt: (ML), As above,	5	Macro-	0				
	moist.		sampler					
	14.5-16ft: Gravelly Silty Clay: (CL), Olive gry				Sample collected for off-			
15	(5Y4/1) to med gry (N5), v fine to fine, unconsid,				site laboratory analysis.			
	poorly sorted, subang to subrd, moist.				Sample number:LO19115			
				-				
20	´ .							
_								
_								
ا ہے۔ا								
25	اً							
	. 🗕							
	· 🛶							
	4							
20-	4							
30	4							
	4							
	4							
	4							

Projec	t Name: Loring AFB	1			Borehole No.: PBH-7		
Projec	t Number: 22784	Elevation: TBD					
Locati	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98					
Driller.	Patrick St. Peter and Sons	Total Depth (ft): 12					
	ment: Geoprobe	Depth	to Bedro	ock (ft)	: TBD		
	g Method: Drive/Hammer	Hole D	iameter	(in):	2		
	g Fluid: None	Depth	to Water	r (ft):	4		
Compi	letion: Completed as Perimeter Borehole	Logge	d By: P.	Linley	Borehole flooded with muck - unable to reach bedrock.		
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments		
-	0-4ft: <b>Gravelly Clayey Sandy Silt:</b> ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to med coarse, unconsid, poorly sorted, subang to subrd, moist to wet - lower 4 inches.	1	Macro- samper	0	The Geo-probe Macro- sampler is 4ft in length.		
5_	4-8ft: <b>Gravelly Clayey Silt</b> : <i>(ML)</i> , Olive gry (5Y4/1) to it olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet.	2	Macro- sampler	0			
	8-9.5ft: <b>Gravelly Silty Clay:</b> (CL), Olive gry (5Y4/1) to It olive gry (5Y6/1), v fine to fine, unconsid, poorly sorted, subang to subrd, wet to saturated.	3	Macro- sampler	0			
15_	9.5-12ft: <b>Gravelly Silty Clay:</b> (CL), As above, wet/saturated.	4	Macro- sampler	0	Sample collected for off- site laboratory analysis. Sample number:LO19114		
20				ŕ			
25							
30	- - -						

Projec	t Name: Loring AFB				Borehole No.: PBH-8			
	t Number: 22784	Elevation: TBD						
Location	on: JEBS	Date Started:8/27/98 Date Completed: 8/27/98						
Driller:	Patrick St. Peter and Sons	Total Depth (ft): 16.1						
Equip	ment: Geoprobe		to Bedro					
Drilling	Method: Drive/Hammer		iameter		2			
Drilling	r Fluid: None		to Water		7			
Compl	etion: Completed as Perimeter Borehole		By: P.					
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments			
_	0-4ft: Gravelly Clayey Sandy Silt: (ML), Med	1	Масго-	0	The Geo-probe Macro-			
_	yel brn (10YR5/4) to It olive gry (5Y6/1) to olive gry (5Y4/1), fine to v fine, unconsid, poorly sorted, subang to subrd, moist.		sampler		sampler is 4ft in length.			
5_	4-8ft: <b>Gravelly Clayey Silt:</b> (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	2	Macro- sampler	0				
_	subang to subrd, moist.  8-12ft: <b>Gravelly Clayey Silt:</b> (ML), As above, moist.	3	Macro-	0				
10_	-		sampler					
	12-14ft: <b>Gravelly Clayey Silt:</b> (ML), As above, moist.	4	Macro- sampler		Sample collected for off- site laboratory analysis.			
15	14-16.1ft: Gravelly Clayey Silt: (ML), As above.	5	Macro- sampler		Sample number:LO19114			
	_			-				
20	,							
	7							
-	=							
<sup>25</sup> _	_							
$\exists$								
30	. =							
$\exists$	=							

	et Name: Loring AFB				Borehole No.: PBH-9		
	et Number: 22784	Elevation: TBD					
Locati	on: JEBS	Date Started: 9/4/98   Date Completed: 9/4/98					
	Patrick St. Peter and Sons	Total Depth (ft): 16.5					
	ment: Geoprobe	Depth	to Bedro	ck (ft)	: 16.5		
Drilling	g Method: Drive/Hammer		iameter		2		
Drilling	g Fluid: None		to Water		TBD		
Comp	letion: Completed as Perimeter Borehole		By: P.				
			•				
Depth (ft)	Description	Sample Number	Sample Type	Hnu Reading	Comments		
_	0-0.5ft: Concrete				The Geo-probe Macro-		
-	0.5-4ft: Gravelly Sandy Clay: (CL), Mod olive brn	1	Macro-	0	sampler is 4ft in length.		
_	(5Y4/4), gravels to 5cm angular edges, moderate		sampler				
5-	cementation, clay content increases with depth,						
) °-	moist.						
	4-8ft: Gravelly Sandy Clay: (CL), Olive gry	2	Macro-	0			
-	(5Y4/1), moist, low plasticity, v slow dilatence,		sample				
-	gravels to 2cm, gravels rounded, no oder.						
10-	8-12ft: Gravelly Sandy Clay: (CL), Mod olive	3	Macro-	0			
10_	brn (5Y4/4), as above.		sample				
_	12-14ft: <b>Gravelly Sandy Clay:</b> (CL), As above.	4	Macro-	0			
_	44.40%		sampler				
15	14-16ft: Gravelly Sandy Clay: (CL), Mod olive	5	Macro-	0			
'3-	brn (5Y4/4), as above.		sampler				
	16-16.5ft: <b>Gravelly Sandy Clay:</b> (CL), As above.	6	Macro-	22	Sample collected for off-		
-			sampler	-	site laboratory analysis:		
-	_				Sample number:LO19091		
20-							
20_	<u>'</u>						
_							
_				}			
25-							
25_	_						
_	·						
_				1	,		
_					i		
30							
<sup>30</sup> -							
_		l	ĺ				
-		l	l		,		
$\dashv$		ĺ					

Projec	t Name: Loring AFB	T			Borehole No.: PBH-10		
	t Number: 22784	Elevation: TBD					
	on: JEBS	Date Started:9/4/98   Date Completed: 9/4					
	Patrick St. Peter and Sons	Total D	12.5				
Equipr	ment: Geoprobe		to Bedro				
	Method: Drive/Hammer		iameter		2		
	Fluid: None		to Water		TBD		
Compl	etion: Completed as Perimeter Borehole		By: P.				
			be /be	Reading			
Œ	Description		1	ad	G		
£	Description	l pe	) ad	A.	Comments		
Depth (ft)		Sample Number	Sample Type	H			
	0-0.5ft: Concrete	0) 2	0)		The Geo-probe Macro-		
_	0.5-4ft: Gravelly Sandy Clay: (CL), Mod olive	1	Macro-	0	sampler is 4ft in length.		
-	brn (5Y4/4), graveis to 4cm mostly angular edges,	<u> </u>	sampler	•			
_	moist, clay content increases with depth, low						
5	plasticity, v slow dilatence.				i		
_	4-8ft. Gravelly Sandy Clay: (CL), Mod olive brn	2	Macro-	0			
_	(5Y4/4) intermingled with It olive gry (5Y5/2),	_	sampler				
-	moist, gravels 11cm rounded.						
-	8-12.5ft: Gravelly Sandy Clay: (CL), As above,	3	Macro-	0	Sample collected for off-		
10	moist.		sampler		site laboratory analysis.		
					Sample number:LO19053		
					and FD/LO19039		
		=					
15_	_						
_	_						
_	_			-			
_	_						
	,						
20	_						
_	4						
_	_						
_	- · ·				i		
25	-						
-~	4						
	-						
-	4						
-							
30	4						
<b>~~</b>	+						
-	-						
_	Ⅎ						
-	4			ļ			
				i			

# H-Nu Survey

Borehole: JEBSC	11617 (PB-1	) Storage Temp	~	96
Date: 8.27.98	<u> </u>			
Depth ( ff )	PID Scan Reading (ppm)	PIP Headspace Reading (1PM)		
_0-2_	0			
2-4	0	•		
4-6:				
6-8				
<u>8-10</u>		•		
10-12				
12-14				
<u> 14-11-</u> <u> 16-17</u>	0	17 1019123	ij	
		.· •		
	-	١		
		·		

Technician: PROSSIGNOL / G. BERUBE

# H-Nu Survey

Date: 8:27 98    Depth ( ft )   Scan   Headspace   Reading (ppn)	Bore	Borehol	le:	JEI	350	2182	0 (PB	(-2)	brege	Temp	~	٥٢
Depth (44)  Reading (ppm)  Reading (	Date	Date:		8.2	7.98	PID		PIP	<b>50</b> - 44			
2-4 9-6 6-8 8-70 70-12 12-14 0 14-16 0 16-18	Dept	Depth (	(H)			Reading	(PP-)	Reas	ling (1	rpm)		
8-10 10-12 12-14 0 14-16 0 16-18		0-	- 2	_			<u> </u>					
8-10 10-12 12-14 0 14-16 0 16-18	C	<u></u> <u>-</u> 4-	6		•		0					
12-14 14-16 0 16-18 0 28 (19119)							0					
16-18 0							<u> </u>					
							0			0	1	
				)			0	28	_ <u>L</u> O	19117		
	<del></del>											•
Technician: PROSSIGNOL / G. BERURE	Tech	Technicia	an: <u>F</u>	Ros	51 <i>61VOL</i> _	16.B	: ERVRE	_				

Borehole: <u>JEBSO</u>	31618 (PB-3	) Storage Temp	~	°F
Date: 827 9				
Depth ( ff )	PID Scan Reading (ppm)	PID Headspace Reading (1pm)		
<u>.0-2</u> 2-4	0			
4-6	0			
8-10	0			
<u> 10 - 12</u> 12 - 14	0			
<u>14-16</u> • 16-18	<u> </u>	23 <u>L019124</u>	/	
18-20	6	22		

Technician: PROSSIGNOL 16 RERUBE

•	Borehole: JEBSOL	11617 (PB-4	Storage Temp	~	٥F
	Date: 8.27.98	PID	PIP		
	Depth ( FF )	Scan Reading (ppm)	Headspace Reading (1pm)		
	0-2	0			
	<u>-2-4</u> <u>4-6</u> :	0			
	6-8		·		
	<u>10-12</u>	0			
	<u> 12-14</u> 14-16				
MPLE —	→ 16-17.5		27 1019117	j	
			1		
			•		
	Technician: PROSSIGN	2/6 BERUBE			

Borehole: JEBSOS	51416 (PB-5	) Storage Temp	~	٥٢
Date: 8.27 98				
Depth (ff)	PID Scan Reading (ppm)	PIP Headspace Reading (1PM)		
	O O			
<u>4-6</u> :	0			
8-10 10-12	<u> </u>	· .		
12-14	0	15 L019116		
			i j	
		1		

Technician: PROSSIGNOL/G BERUBE

Date: $8.27$ Depth $(4)$	PID Scan Reading (ppm)	PID Headspace Reading (1PM)	
0-Z -2-4 -4-6 -6-8 -8-10 -10-12 12-14	: 000000		
14-16	0	6 L019115 -	i

Borehole: <u>TEBSO710</u>	012 (PB-7	Storage Temp	~	۰F
Date: <u>827.98</u>		D. 0		
Depth ( ff )	PID Scan Reading (ppm)	PIP Headspace Reading (1Pm)		
0-2	<u> </u>			
_2-4		•		
$\frac{4-6}{2}$ :				
6-0	$\overline{}$			
<u>0-10</u> <u>10-12</u>	0	29 1019114		
		•	i <sup>j</sup>	•
•		;		
		١		

Technician: PROSSIGNOL/G BERUBE

Borehole: <u>JEBS08/</u>	214 (PB-8	3) Storage Temp	~	٥Ç
Date: 8.27.98	PID	PIP		
Depth ( ff )	Reading (ppm)	Headspace Reading (1PM)		
<u>0-2</u> 2-4	<u> </u>	•		
<u>4-6</u> :	0	·		
8-10				
10-12		25 LO19112		
			/	
	<u>:</u>	-		
,		, ,		
Technician: P. ROSSIGNOL	16 BERUBE	_		

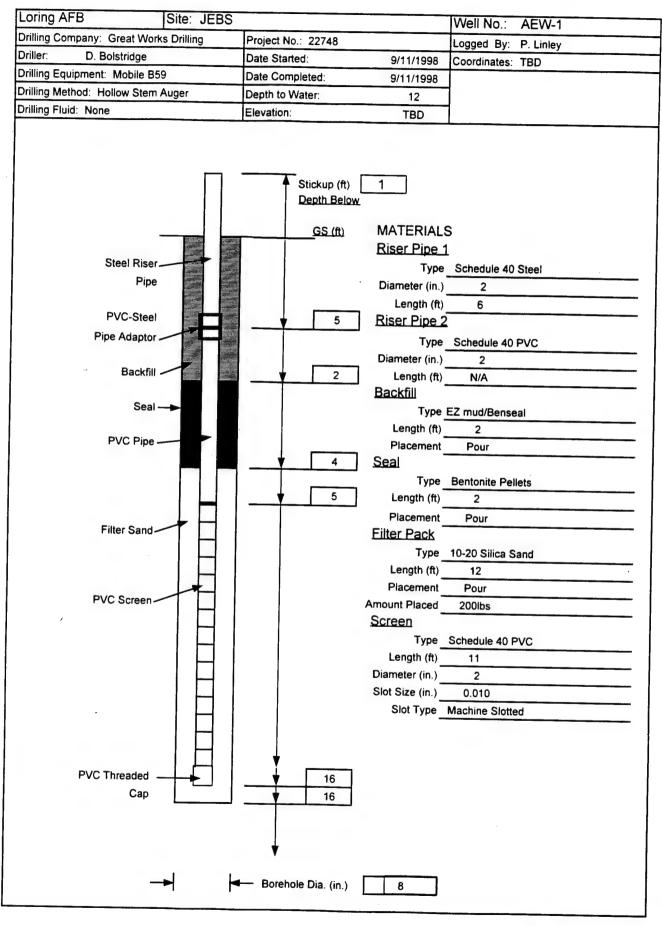
Borehole: PBH-09	/JEBS09 (PB-	9) Storage	Temp	~	۰F
Date: 9-4-98		V	•		
Depth ( ff )	PID Scan Reading (ppm)	PIP Headspace Reading (1P	m)		
0-2	<i>O</i> :		٠.		
2-4	<u> </u>		• .	•	
4-6	0				
6-8	O		<i>y</i> *		
8-10					
10-12					
12-14					
14-16	_ 70	22 2019091			
				<i>j</i> <sup>1</sup>	
The second secon					
·		-			
•			1	٠	
Testeriaine					

Borehole: JEBS 10	(PB-10)	Storage Temp	~	٥Ę
Date: 9-4-98	PID	PIP	•	
Depth (FF)	Scan Reading (ppn)	Headspace Reading (1pm)		
02	0			
4-6	0			
<u>6-8</u> 8-10	. 0			
10-12- 12-11/2:5	<u> </u>	18_1019053 2019039.5		
			j	
<del></del>		offerent		

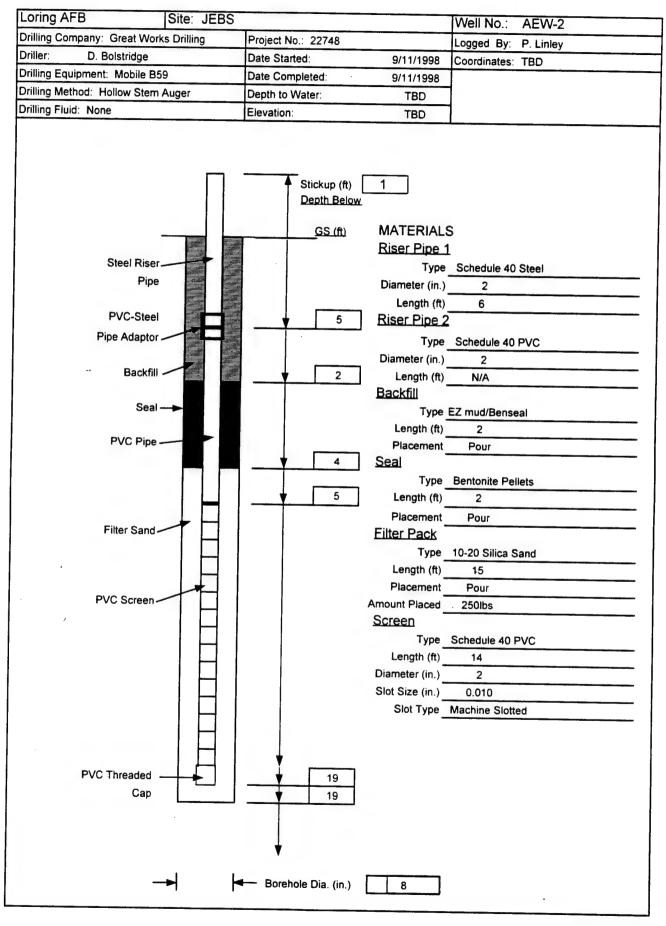
## APPENDIX B

## AIR EXTRACTION WELL, PASSIVE AIR VENT, MONITORING POINT BORING LOGS AND WELL CONSTRUCTION LOGS

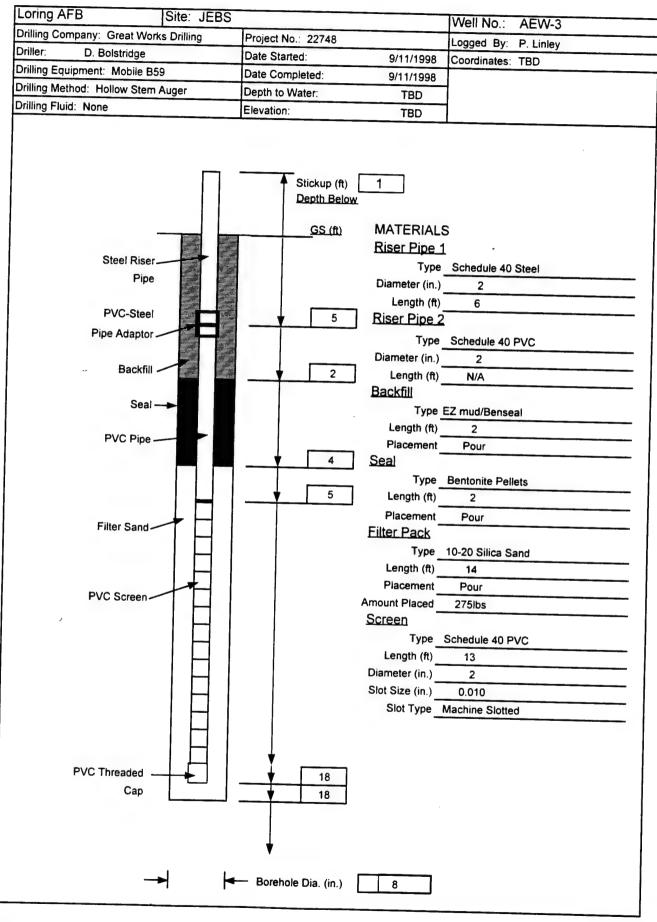
Projec	ct Name: Loring AFB				Borehole No.: AEW-1
	ct Number: 22784	Elevati	on:	TBD	Borenole No.: AEVV-1
Locati	on: JEBS				Date Completed: 9/11/98
Driller	: Great Works Drilling	Total D	epth (ft)		16
	ment: Mobile B59		to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
Drilling	g Fluid: None		o Water		12
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
-	0-0.25ft: Asphalt				No samples required to be
-	0.25-0.75ft: Fill - Gravel				collected during installation
-	0.75-16ft: <b>Gravelly Clayey Silt:</b> <i>(ML)</i> , Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
5	sorted, unconsid, subang to subrd.				
_	- Substantial Control of Control	•			
	-				
	8ft: Moist.				
	-	ł		İ	
10_	,				
	٦				
_	12ft: Wet to soupy.		. ]		
_		1			j
15					
13-	16#: Bodrocks Limest	ĺ	ĺ		
-	16ft: Bedrock: Limestone.	i	ĺ		
$\dashv$		ŀ	1	-	
$\dashv$	4		l		· ·
20					
	· +				
	·	1	]	- 1	·
	7.	- 1	- 1		
a_ —	]	1	1		
25	·	1	1		1
_	]	-	i		
$\dashv$	_	İ	!		
-	_				
30	4		1		
	4				
$\dashv$	<u> </u>				
$\exists$					



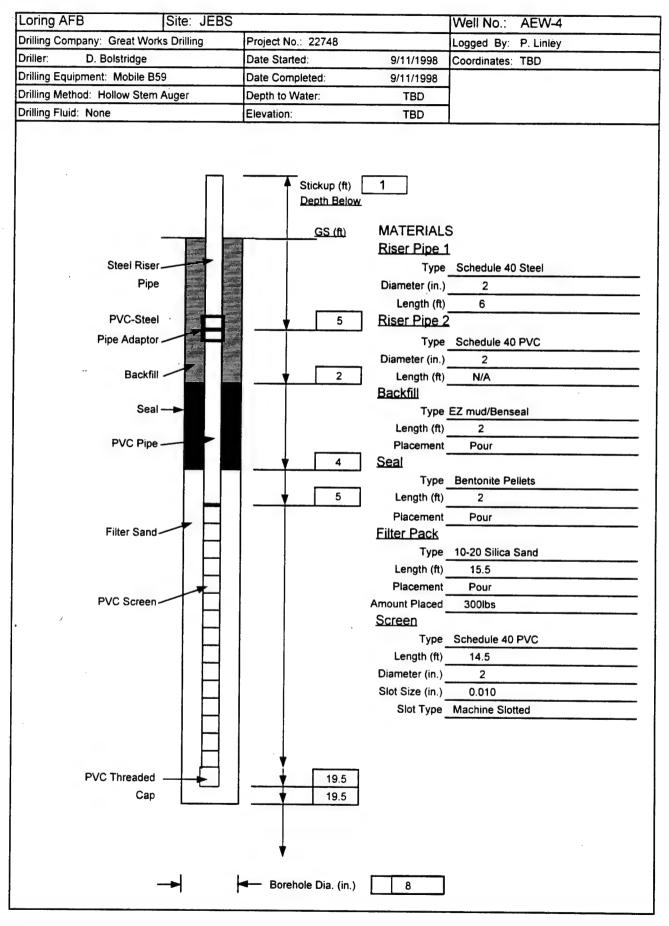
Proiec	t Name: Loring AFB	T			Borehole No.: AEW-2
	t Number: 22784	Elevati	on.	TBD	Dorellole IVO ALVV-2
	on: JEBS				Date Completed: 9/11/98
Driller:	Great Works Drilling	Total D	epth (ft)		19
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger		iameter		8
	Fluid: None		o Water		TBD
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details			,	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel				collected during installation
_	0.75-19ft: Gravelly Clayey Silt: (ML), Lt olive				
	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
5_	sorted, unconsid, subang to subrd.				Refusal at 5ft BGL,
					relocated approx. 6ft south
-	· <b>-</b>				of original location to
-	-				continue advancement.
10	-				
'~-	_				
-	4				
-	4				
	-				,
15	-				İ
	<b>–</b>				
				- 1	
	19ft: Bedrock: Limestone.				1
20	7				
	7			ı	
	7				1
					i
				1	
25					· i
_	_ ·			ĺ	
		ļ			
$\dashv$	_				
30	4			l	
30	_		]		
-			l		
l    ⊢	4	ļ			
-	4	1	l		



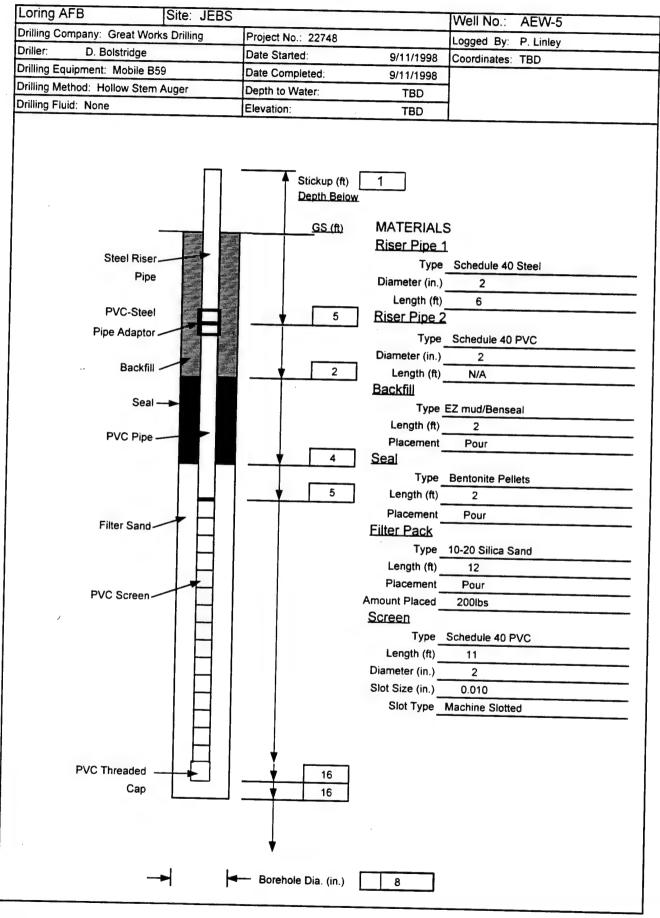
Projec	t Name: Loring AFB				Borehole No.: AEW-3
Projec	t Number: 22784	Elevati	on:	TBD	
	on: JEBS	Date S	tarted:9/	11/98	Date Completed: 9/11/98
	Great Works Drilling		epth (ft)		18
	ment: Mobile B59	Depth i	o Bedro	ck (ft):	18
	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None	Depth t	o Water	(ft):	TBD
Compi	letion: Completed as a Soil Vapor Extraction Well	Logged	I By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel				collected during installation
_	0.75-18ft: Gravelly Clayey Silt: (ML), Lt olive				Refusal at 3ft BGL, (3x),
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				1st refusal relocated 3ft
<b>–</b>	sorted, unconsid, subang to subrd.				north of original location,
-	<u>-</u>				2nd refusal relocated 6ft
-	· -	į			east of original location, 3rd refusal relocated 6ft
-	−				north of original location.
10	-				north of original location.
	-				
	7				
_					
45-					
15_	_				
_					
_	18ft: Bedrock: Limestone.			-	
_	- Total Boardskii Emicosofie.				
20	<b>,</b>				·
	7				
	7			Ì	
				- 1	
25					
25	_				
	4				
_	4				
-	-			1	
30	+				
	4			- 1	
	1		1		
	7		ĺ		



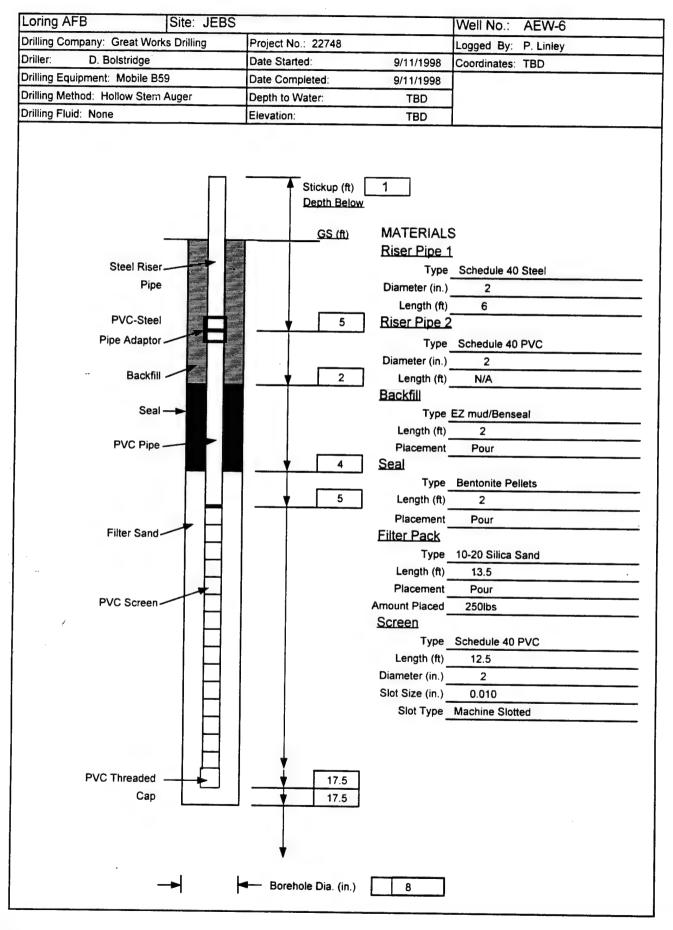
Projec	t Name: Loring AFB				Borehole No.: AEW-4
	t Number: 22784	Elevation	on:	TBD	
	on: JEBS	Date S	tarted:9/	11/98	Date Completed: 9/11/98
	Great Works Drilling	Total D	epth (ft).	•	19.5
Equipr	nent: Mobile B59	Depth t	o Bedro	ck (ft):	19.5
Drilling	Method: Hollow Stem Auger	Hole Di	ameter (	(in):	8
	Fluid: None	Depth t	o Water	(ft):	TBD
Compl	etion: Completed as a Soil Vapor Extraction Well	Loggeo	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel	9			collected during installation
_	0.75-19.5ft: Gravelly Clayey Silt: (ML), Lt olive				
	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
5_	sorted, unconsid, subang to subrd.				Refusal at 5ft BGL,
_	-				relocated approx. 4ft east
-	<u>-</u>				of original location.
_	_				
10					
''-	_				
-	-		:		
_	-				
	-				
15	-				
"-	-				
-	-				
_	-			-	•
	19.5ft: Bedrock: Limestone.				
20	_				
_	T				
	7				1
	1				
25	·				
	7				
	7				
	7				
	7				i
30	7				
	٦				
	7	l			
	7				



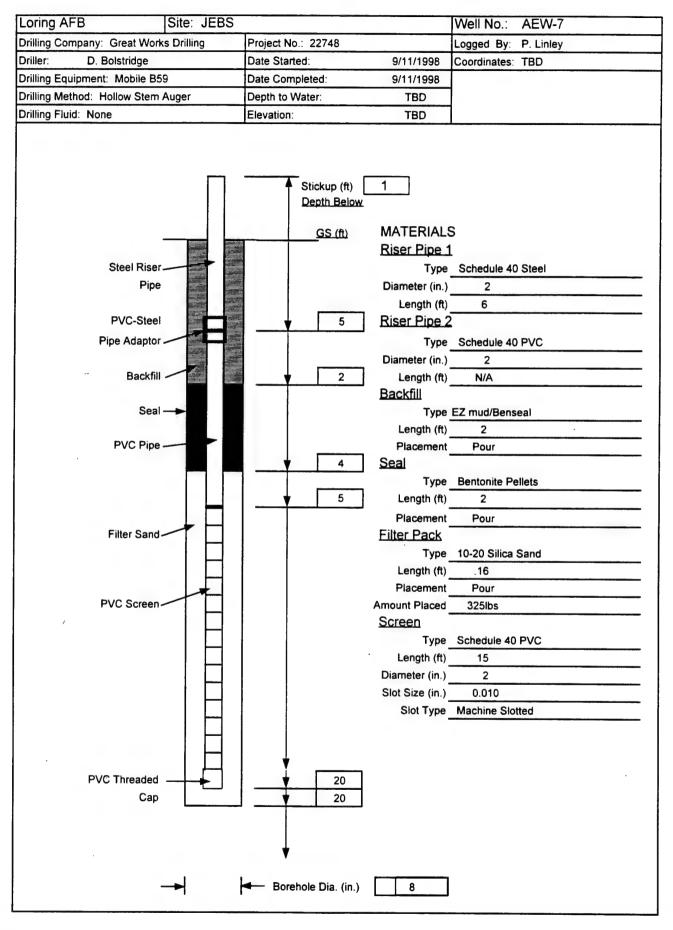
Projec	ct Name: Loring AFB				Borehole No.: AEW-5		
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98					
	: Great Works Drilling	Total Depth (ft): 16					
	ment: Mobile B59		o Bedro				
Drillin	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		o Water		TBD		
	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details		,				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly sorted, unconsld, subang to subrd.				No samples required to be collected during installation		



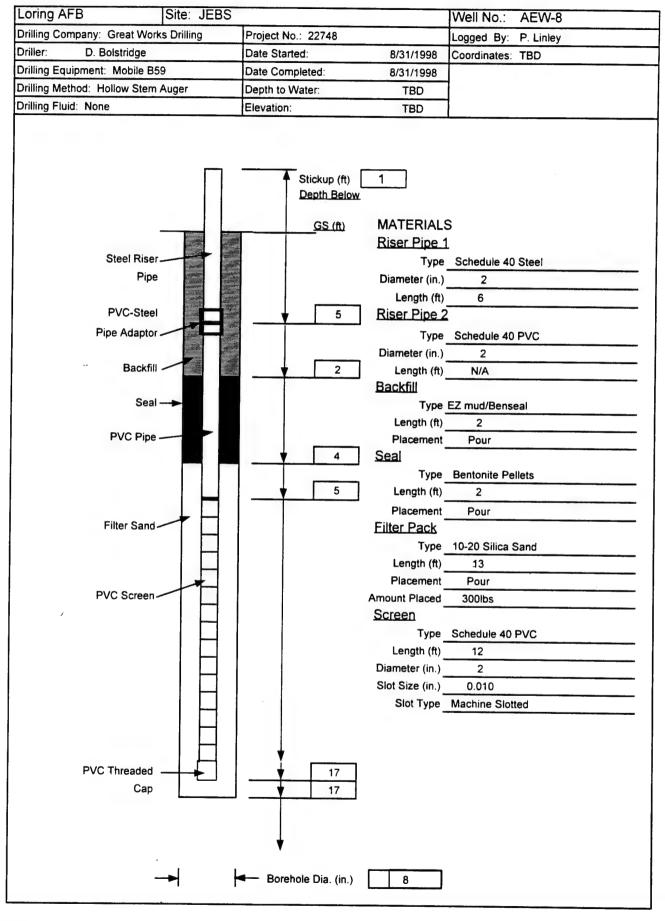
Proied	et Name: Loring AFB				Porchala No : ACIA/C			
	et Number: 22784	Elevati	on:	TBD	Borehole No.: AEW-6			
	Location: JEBS			Date Started:9/11/98   Date Completed: 9/11/98				
Driller	: Great Works Drilling	Total C	epth (ft)		17.5			
	ment: Mobile B59		to Bedro					
	g Method: Hollow Stem Auger		iameter		8			
	g Fluid: None		o Water		TBD			
	letion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details		. <b>.</b>	Limey				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-0.25ft: Asphalt				No samples required to be			
_	0.25-0.75ft: Fill - Gravel				collected during installation			
-	0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive							
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly							
~-	sorted, unconsid, subang to subrd.							
i -								
-	-							
-	· -							
10	1 ⊣		ĺ					
_	-							
-	-				1			
_	-							
_	-				,			
15	-							
-	<b>–</b>							
	17.5ft: Bedrock: Limestone.				·			
	-	-						
	-				1			
20	1,	l						
	· •		1					
	7							
	7	ŀ	1		İ			
	7	l						
25	7							
	. 7							
	7	1						
	7							
	]				]			
30	]	İ			i			
	]							
4			ĺ					
$\dashv$	]							



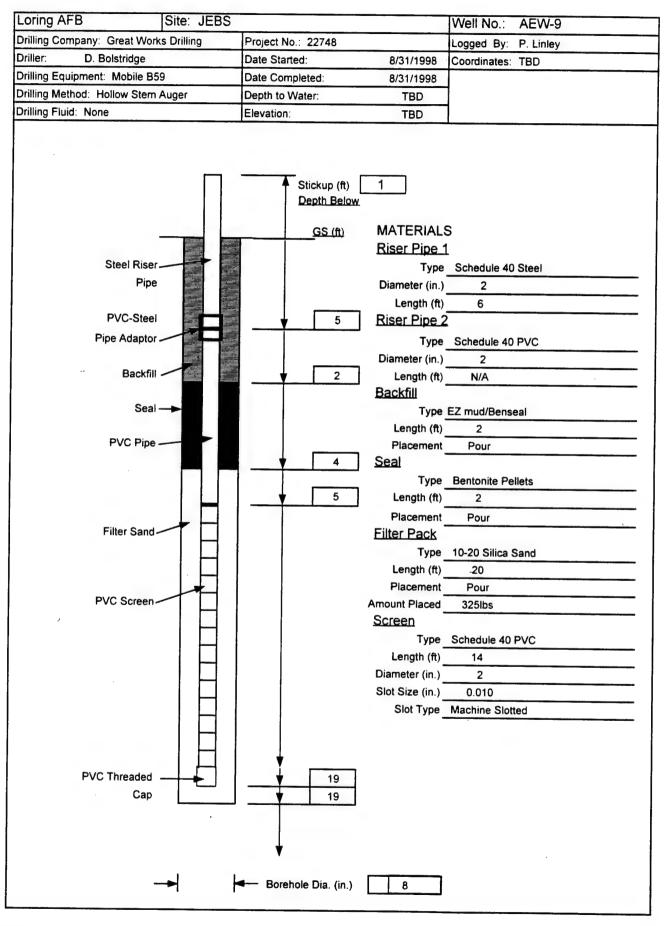
Projec	ct Name: Loring AFB				Dometrale Mr. ACIME
	ot Number: 22784	Elevati	on:	TDD	Borehole No.: AEW-7
	ion: JEBS			TBD	Data Camata Laurana
	: Great Works Drilling				Date Completed: 9/11/98
	ment: Mobile B59		epth (ft)		20
	g Method: Hollow Stem Auger		to Bedro		
	g Fluid: None		iameter		8
	letion: Completed as a Soil Vapor Extraction Well		o Water		TBD
Comp	See Construction Log for details	Logged	I By: P.	Liniey	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
-	0-0.25ft: Asphalt				No samples required to be
_	0.25-0.75ft: Fill - Gravel				collected during installation
_	0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive				
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
	sorted, unconsid, subang to subrd.				
-					
_	4				
-	4				
10					
''-	_				·
-	_				
-	_			1	
_					
15	_				
"~		İ			İ
_	-	ļ			
-	_			- [	
-					
20	20ft: Bedrock: Limestone.				·
-	,	[			
$\dashv$	<b>-</b>				
$\dashv$	` -		-		
$\dashv$	-4				
25	4				
	4	j			
$\dashv$	4				
-	4				
_	4				
30	4	1			ļ
- T	· 4				
$\dashv$	· 4	1	ł		
-	4		- 1		
$\dashv$	4	Ì	- 1		



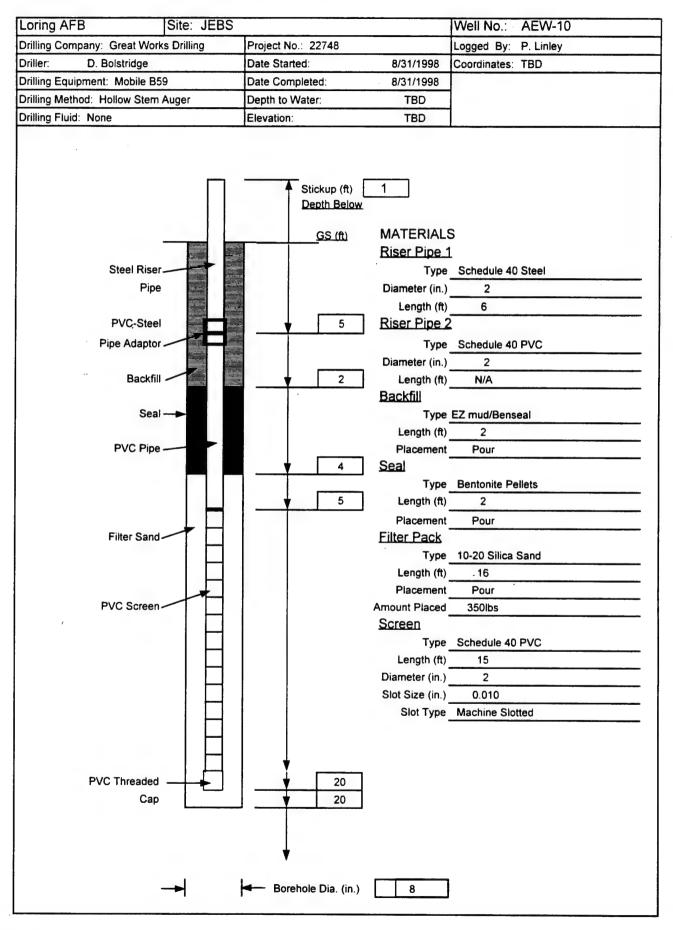
Project Name: Loring AFB				Borehole No.: AEW-8		
Project Number: 22784		on:	TBD			
Location: JEBS	Date St	Date Started:8/31/98 Date Completed: 8/31/98				
Driller: Great Works Drilling		epth (ft).		17		
Equipment: Mobile B59	Depth t	o Bedro	ck (ft):	17		
Drilling Method: Hollow Stem Auger	Hole Di	ameter (	(in):	8		
Drilling Fluid: None		o Water		TBD		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley			
Description (#	Sample Number	Sample Type	Blow Count	Comments		
0-17ft: <b>Gravelly Clayey Silt</b> : ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-6 inches in diameter.  10  17ft: <b>Bedrock</b> : Limestone.				No samples required to be collected during installation		



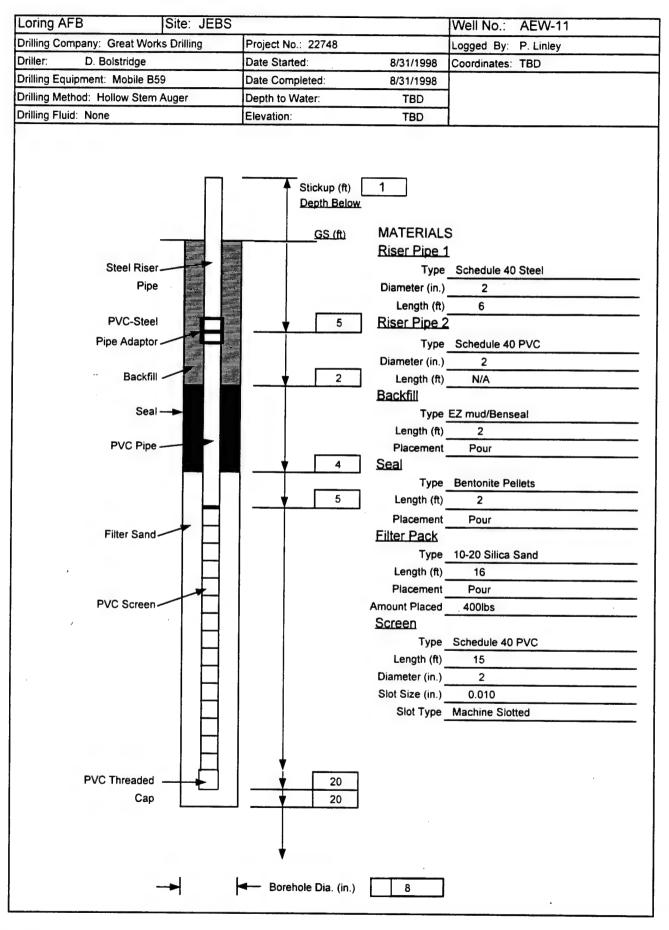
Projec	t Name: Loring AFB				Borehole No.: AEW-9		
			Elevation: TBD				
Location: JEBS			Date Started:8/31/98 Date Completed: 8/31/98				
	Great Works Drilling	Total Depth (ft): 19					
	ment: Mobile B59	Depth	to Bedro	ck (ft).	19		
	n Method: Hollow Stem Auger	Hole D	iameter	(in):	8		
	Fluid: None		to Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley			
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry		92		No samples required to be		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
	poorly sorted, subang to subrd.		]				
5	_						
"-	4						
-	~ -						
	-		l				
	-		l				
10	-						
-	-		,				
	-						
	Ħ						
	1						
15	J						
	· ]						
_	10th Badasaka Lina	i					
20	19ft: Bedrock: Limestone.			ŀ			
20-	,		- 1	1			
-	·			ł			
	-	1					
	4	Ì					
25	4	ĺ					
	4						
	·						
	7						
	7			- 1			
30	7						
	]						
_	]		İ				
$\dashv$	]						



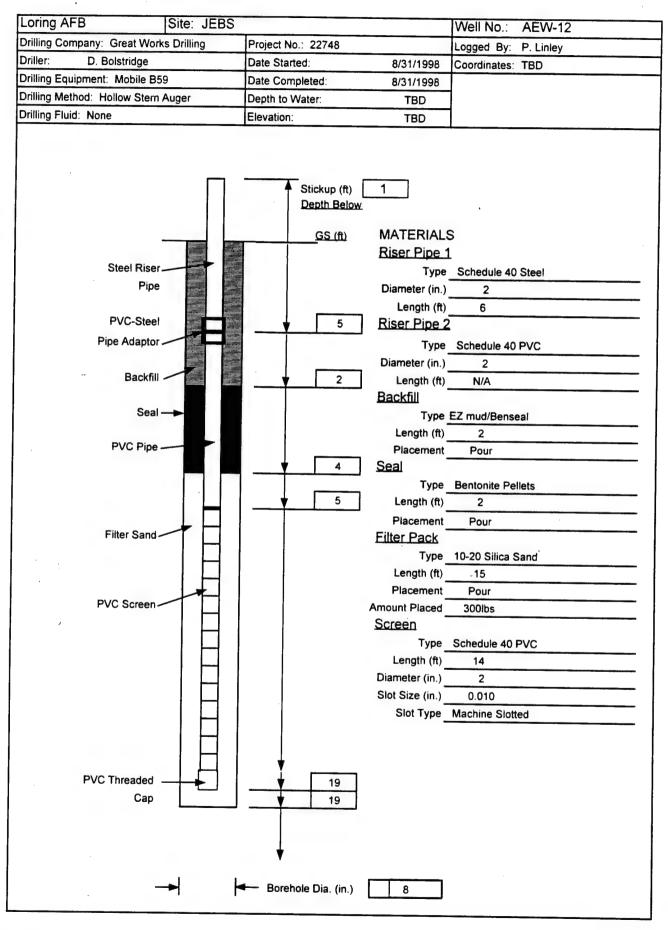
Projec	et Name: Loring AFB				Borehole No.: AEW-10	
	et Number: 22784	Elevati	on:	TBD	Dorenoie IVO ALVV-10	
Locati	on: JEBS	Date Started: 8/31/98 Date Completed: 8/31/98				
Driller.	Great Works Drilling	Total Depth (ft): 20				
	ment: Mobile B59		o Bedro			
Drilling	g Method: Hollow Stem Auger		iameter		8	
	g Fluid: None		o Water		TBD	
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.			
	See Construction Log for details			,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be	
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
-	poorly sorted, subang to subrd.					
5	4					
~-	-					
-	<b>1</b>					
-	<b>†</b>					
-						
10	·					
	-				<u>.</u>	
	1					
_	1					
15						
				}		
_	_			.		
-			i		Í	
20	20ft: Bedrock: Limestone.					
	ZOIT: Bedrock: Limestone.			l		
-						
$   \exists$	-			l		
	4					
25		ľ		1		
	┥.					
	·					
	7		l			
	7	1	. 1			
30	7					
4		l		ļ		
-				1		



Proje	ct Name: Loring AFB	T			Borehole No.: AEW-11		
	ct Number: 22784	Elevati	on:	TBD	Dorentice IVO ALVV-11		
Locat	ion: JEBS	Date Started:8/31/98   Date Completed: 8/31/98					
Drille	r: Great Works Drilling	Total D	epth (ft)	:	20		
Equip	ment: Mobile B59		to Bedro				
Drillin	g Method: Hollow Stem Auger		iameter		8		
	g Fluid: None		to Water		TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details			,			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl to 3 inches in diameter, moist.	N N	Sc Ty	18	No samples required to be collected during installation		



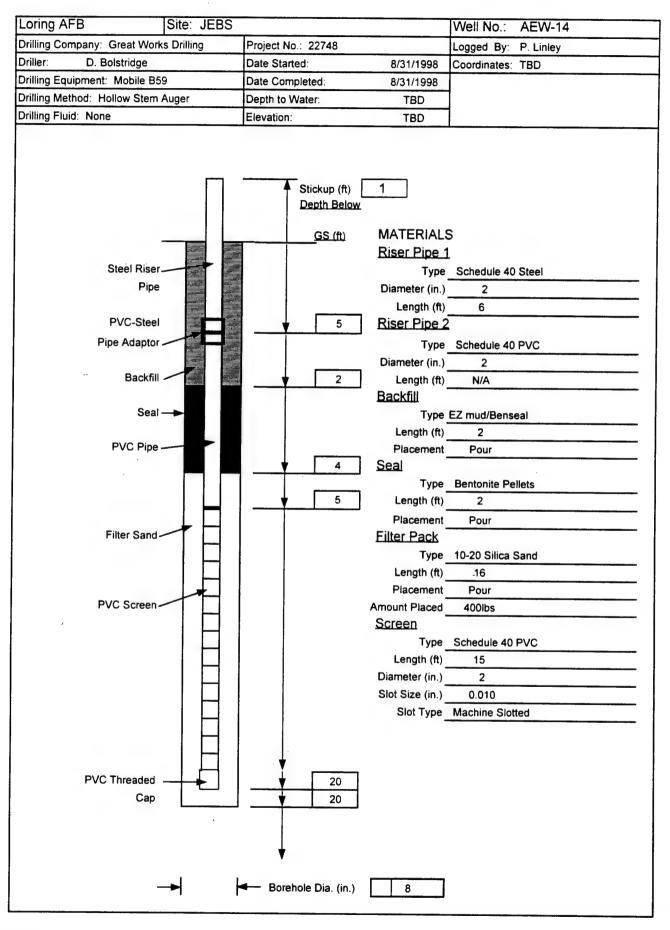
Proiec	t Name: Loring AFB	Γ			Borehole No.: AEW-12			
	t Number: 22784	Elevation	on.	TBD	Bureffule IVO AEVV-12			
	on: JEBS	Date Started:8/31/98 Date Completed: 8/31/98						
Driller:	Driller: Great Works Drilling			Total Depth (ft): 19				
	ment: Mobile B59		o Bedro					
Drilling	Method: Hollow Stem Auger		iameter		8			
	Fluid: None		o Water		TBD			
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.					
	See Construction Log for details	00						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
	0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry	0, 2	0,  -		No samples required to be			
10 15 1	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 5-6 inches in diameter.  8ft: Moist.  15-16ft: Cobble zone.  19ft: Bedrock: Limestone.				collected during installation			
30 — — —	- - -							



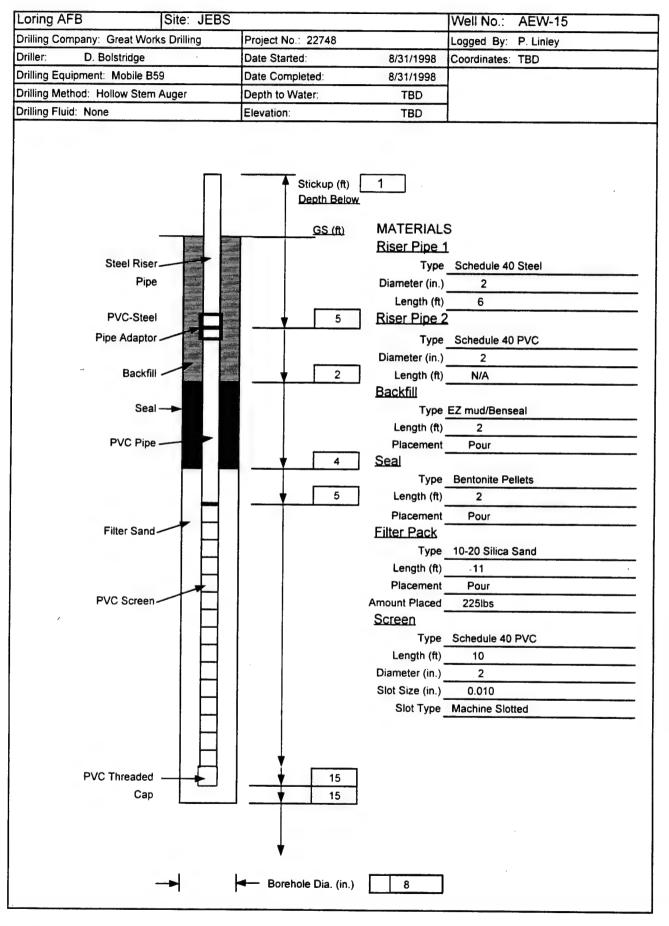
Projec	et Name: Loring AFB				To
	t Number: 22784	Flores	0.00	TOD	Borehole No.: AEW-13
	on: JEBS	Elevati		TBD	D-4- O 1 1 1 2 7 1
	Great Works Drilling				Date Completed: 8/31/98
	ment: Mobile B59		epth (ft)		18
	g Method: Hollow Stem Auger		o Bedro		
	g Fluid: None		iameter		8
			o Water		TBD
Compi	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	I By: P.	Linley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-18ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be
10 1 15 1 20 1 30 1 30 1	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.  9ft: Moist.  11ft: V moist.  18ft: Bedrock: Limestone.				collected during installation

Proiec	t Name: Loring AFB				Porchalo No : AEM/ 25
	t Number: 22784	Elevati	on:	TBD	Borehole No.: AEW-25
	on: JEBS		tarted:9/		Date Completed: 9/1/98
	Great Works Drilling		epth (ft)		12
	ment: Mobile B59		to Bedro		
Drilling	Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details			,	
Depth (ft)	Description  0-12ft: <b>Gravelly clayey silt:</b> (ML), Lt olive gry	Sample Number	Sample Type	Blow Count	Comments  No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld				collected during installation
_	poorly sorted, subang to subrd, gvl to 6 inches in		<u> </u>		
5	diameter.				
"-	5-5.5ft: Cobble zone.				
-					
-	-				
-	-				
10	-				
	-				
	12ft: Bedrock: Limestone.				
				İ	
	7				
15_	]				
	]			Ĭ	
				-	
_	4				İ
20	4				
-~-	<i>'</i>	İ			
	4				
	+		1	İ	
	-				
25	₫	l	ľ		
	<b>-</b>			1	
	7	1			
	7	i		i	
	].				
30	]				ļ
_	]				
4	]		- 1		
$\dashv$	4				

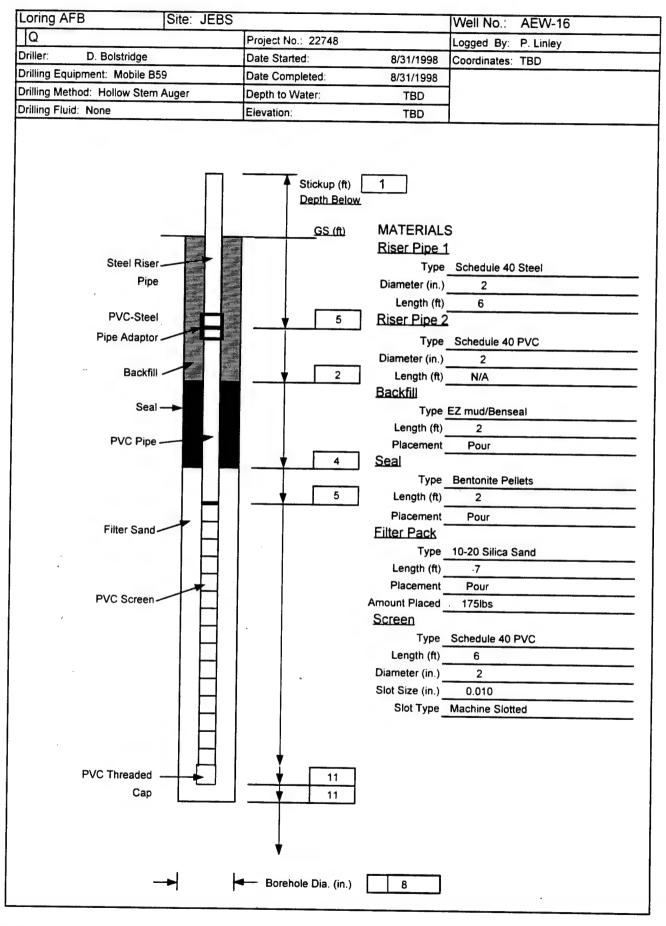
Projec	ct Name: Loring AFB	1			D	
	ct Number: 22784	Florenti	on:	TDD	Borehole No.: AEW-14	
	ion: JEBS	Elevation: TBD				
	: Great Works Drilling	Date Started: 8/31/98   Date Completed: 8/3  Total Depth (ft): 20				
	ment: Mobile B59				20	
	g Method: Hollow Stem Auger		to Bedro			
	g Fluid: None		iameter		8	
Comp	letion: Completed as a Soil Vapor Extraction Well		o Water		TBD	
	See Construction Log for details	Logged	I By: P.	Liniey		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be	
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld				collected during installation	
_	poorly sorted, subang to subrd, gvl to 5 inches in				9	
	diameter.					
5_						
_						
_	. ]					
_				- 1		
10_	7	İ	ļ			
_	<b>1</b>		Ì			
_	·		i			
	1		ł			
	7					
15_		ĺ	- 1			
	7	İ		ı	ļ	
	Ţ.		Í			
	7			-		
	19ft: V moist.	f		ĺ		
20_	20ft: Bedrock: Limestone.		1			
	· <b>1</b>			- 1		
	· 1		]			
	7		ĺ		1	
	7	1	ł		1	
25		- 1				
	₹	i	1			
	-					
	7	-				
	7	- 1				
30	1	-	İ			
	1					
	4		ļ			
	4		Ì			
			]	1		



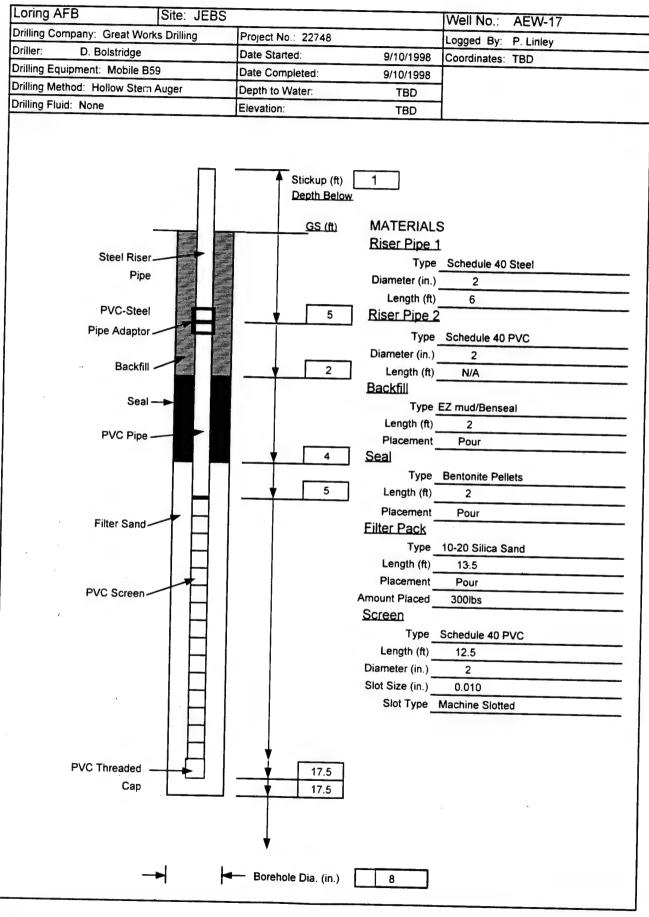
Proied	ct Name: Loring AFB	Τ			Dambala M. ASMA			
	ot Number: 22784	Borehole No.: AEW-15 Elevation: TBD						
	ion: JEBS							
	: Great Works Drilling	Date Started:8/31/98 Date Completed: 8/						
	Equipment: Mobile B59			Total Depth (ft): 15 Depth to Bedrock (ft): 15				
	g Method: Hollow Stem Auger		iameter					
	g Fluid: None		o Water		8			
	letion: Completed as a Soil Vapor Extraction Well		By: P.		TBD			
	See Construction Log for details	Logget	г Бу. г.	Liilley				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
_	0-15ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be			
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	Ů.			collected during installation			
-	poorly sorted, subang to subrd, gvl to 6 inches in							
5	diameter. 5-7ft: Cobble zone.							
~-	3-71t. Cobble zone.							
-	· -							
_	-							
_					İ			
10	<b>-</b>		İ		,			
	-							
_	-							
-	-				1			
	_			ĺ				
15	15ft: Bedrock: Limestone.		]					
	ļ, i — , — , — , — <b>,</b>	ĺ						
	· · ·				·			
	7	,		-				
	7	İ						
20_	· 1		ĺ					
_	]		1		·			
-	]	ļ	ł	}				
		İ						
25	4	ľ		1				
23-	4							
-	4	j						
$\dashv$	4							
-								
30	4	İ	ĺ					
_	4							
$\dashv$	4	- 1	- 1					
$\dashv$	-	ł	ĺ					
7	4		-					



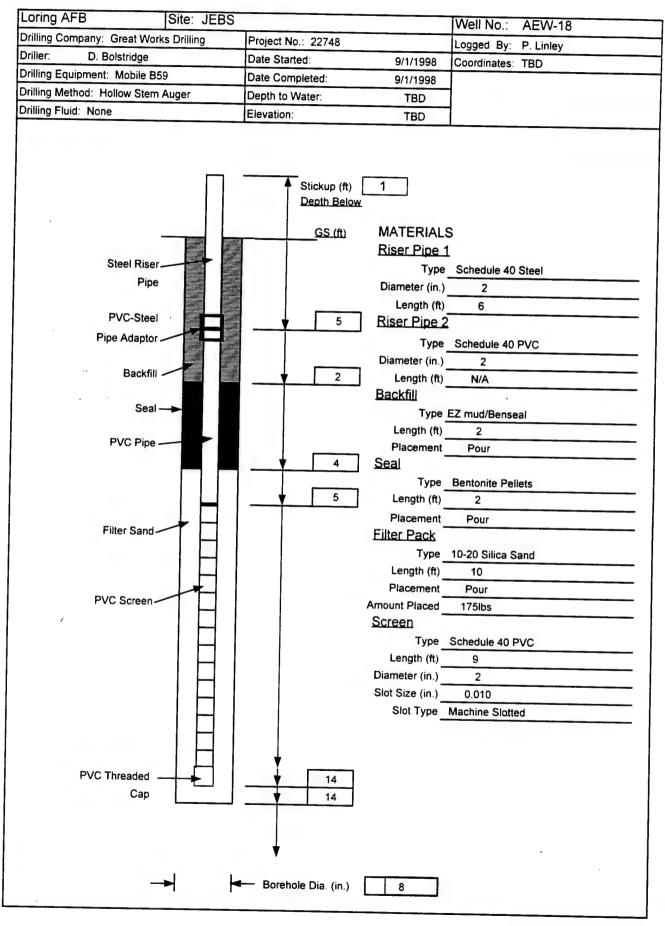
Location: JEBS  Driller: Great Works Drilling  Equipment: Mobile B59  Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well  See Construction Log for details   □	Total [ Depth Hole D Depth		cin):  r (ft):  Linley	Date Completed: 8/31/98 11 11 8 TBD
Location: JEBS  Driller: Great Works Drilling  Equipment: Mobile B59  Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Date S Total L Depth Hole D Depth Logged	Started: 8 Depth (fit to Bedro Diameter to Wate d By: P.	3/31/98 ): ock (ft) (in): r (ft): Linley	Date Completed: 8/31/98  11  11  8  TBD  Comments  No samples required to be
Driller: Great Works Drilling 7  Equipment: Mobile B59  Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Total Depth Hole D Depth Logged	Depth (ft to Bedro liameter to Wate d By: P.	cin):  r (ft):  Linley	11 8 TBD  Comments  No samples required to be
Equipment: Mobile B59  Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Depth Hole D Depth Logged	to Bedro liameter to Wate d By: P.	r (ft): Linley	TBD  Comments  No samples required to be
Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Hole D Depth Logged	iameter to Wate d By: P.	r (in): r (ft): Linley	8 TBD  Comments  No samples required to be
Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Depth Logged	to Wate	r (ft): Linley	TBD  Comments  No samples required to be
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.	Logged	d By: P.	Linley	Comments  No samples required to be
See Construction Log for details  Description  O-11ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.			nut	Comments  No samples required to be
0-11ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), Lt olive gry(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsidpoorly sorted, subang to subrd, gvl 3-4 inches indiameter.	Sample	Sample Type	Blow Count	No samples required to be
(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 3-4 inches in diameter.				No samples required to be collected during installation
poorly sorted, subang to subrd, gvl 3-4 inches in diameter.				collected during installation
10 11ft: Bedrock: Limestone.				



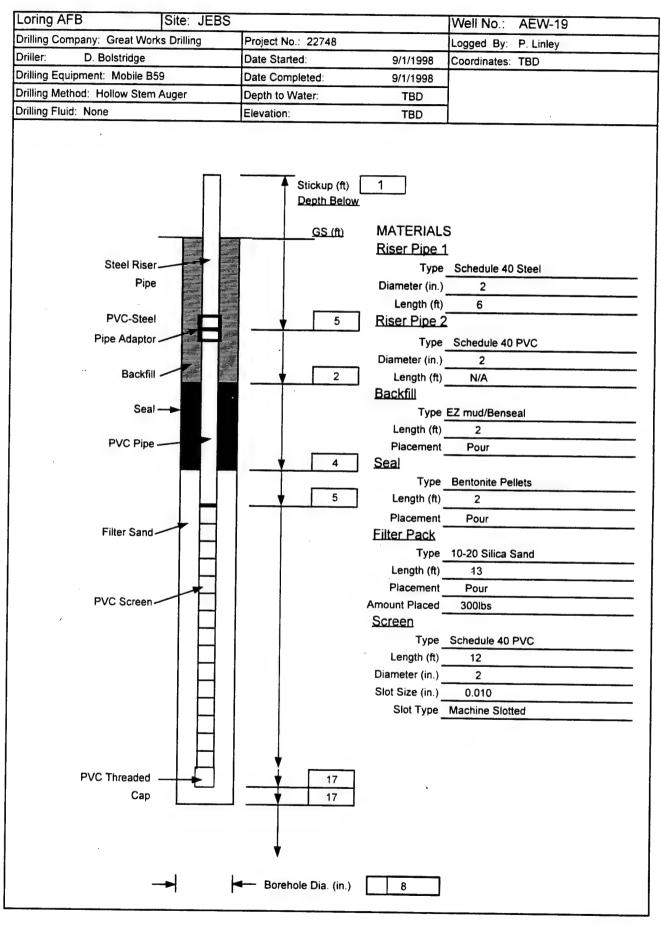
Project Name: Loring AFB Project Number: 22784  Location: JEBS Date Started:9/10/98 Date Completed Driller: Great Works Drilling Total Depth (ft): 17.5  Equipment: Mobile B59 Depth to Bedrock (ft): 17.5  Drilling Method: Hollow Stem Auger Hole Diameter (in): 8  Dilling Fluid: None Depth to Water (ft): TBD  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Example 1	
Location: JEBS       Date Started:9/10/98   Date Completed         Driller: Great Works Drilling       Total Depth (ft):       17.5         Equipment: Mobile B59       Depth to Bedrock (ft):       17.5         Drilling Method: Hollow Stem Auger       Hole Diameter (in):       8         Drilling Fluid: None       Depth to Water (ft):       TBD         Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details       Logged By: P. Linley	1: 9/10/98
Equipment: Mobile B59  Depth to Bedrock (ft): 17.5  Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Total Depth (ft): 17.5  Depth to Bedrock (ft): 17.5  B  Depth to Water (in): 8  Logged By: P. Linley  E	1. 9/10/96
Equipment: Mobile B59  Depth to Bedrock (ft): 17.5  Drilling Method: Hollow Stem Auger  Hole Diameter (in): 8  Depth to Water (ft): TBD  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details	
Drilling Method: Hollow Stem Auger       Hole Diameter (in):       8         Drilling Fluid: None       Depth to Water (ft):       TBD         Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details       Logged By: P. Linley	
Drilling Fluid: None  Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Depth to Water (ft): TBD  Logged By: P. Linley  See Construction Log for details	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Logged By: P. Linley	
See Construction Log for details	
Description  Description  Description  Description  Commel	•
	ntś
U-0.25π:Asphalt No samples requ	ired to be
0.25-0.75π: Fill - Gravel	
0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive	
gry (5Y6/1) to olive gry (5Y4/1), v fine to fine,	
5 unconsid, poorly sorted, subang to subrd.	
· 」	
10	
- " -	
15	
17.5ft: Bedrock: Limestone.	
7 1 1 1	
20	
<b>-</b>	
]	
<b>→</b>	
25	
<b>-</b>	
<b>→</b>	
30	
<b>1</b>	
1	ı



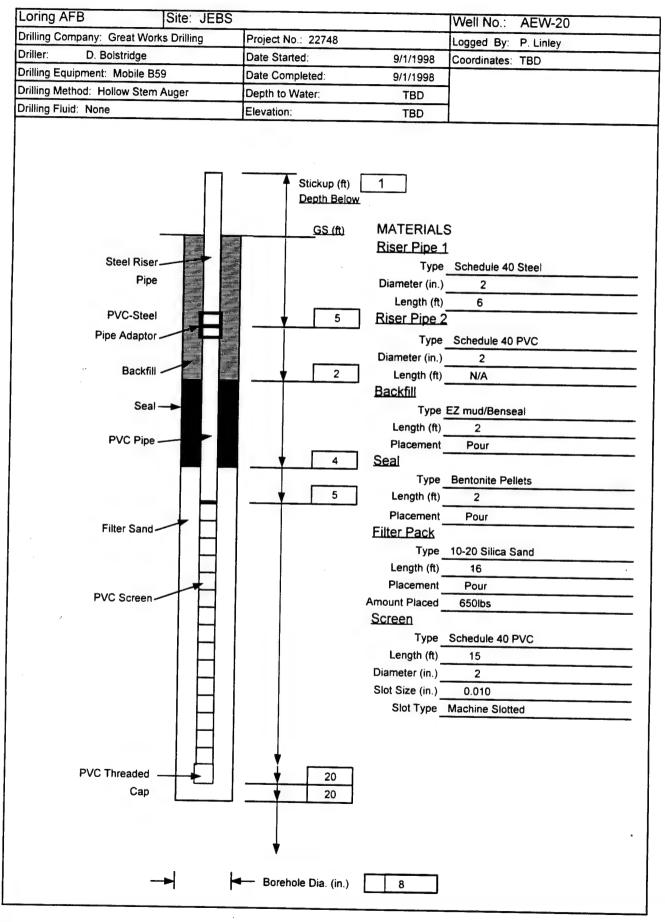
Project Name: Loring AFB   Borehole No.: AEV   Project Number: 22784   Elevation: TBD   Location: JEBS   Date Started:9/1/98   Date Completed: 9	
Date Started:9/1/98   Date Completed: 9/1/98	71/98
Driller: Great Works Drilling   Total Depth (ft): 14	7/96
Depth to Bedrock (ft): 14	
Drilling Method: Hollow Stem Auger   Hole Diameter (in): 8	
Depth to Water (ft): TBD	
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details  Description  Description  O-14ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-5 inches in diameter.  Description	
See Construction Log for details    Comments   See Construction Log for details	
0-14ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), Lt olive gry  (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, gvl 4-5 inches in diameter.	
0-14ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-5 inches in diameter.	
collected during inst poorly sorted, subang to subrd, gvl 4-5 inches in diameter.	to be
diameter.	
5	
	l
- Oil. Millist.	
-	
1 10	
"	
	İ
-	- 1
14ft: Bedrock: Limestone.	- 1
15	
-	
	.
20	ŀ
<b>│</b>	
	Ī
1     ·	
25	
7	ļ
	ļ
]	
	Ì
30	- 1
→ ]	,
_	
_	



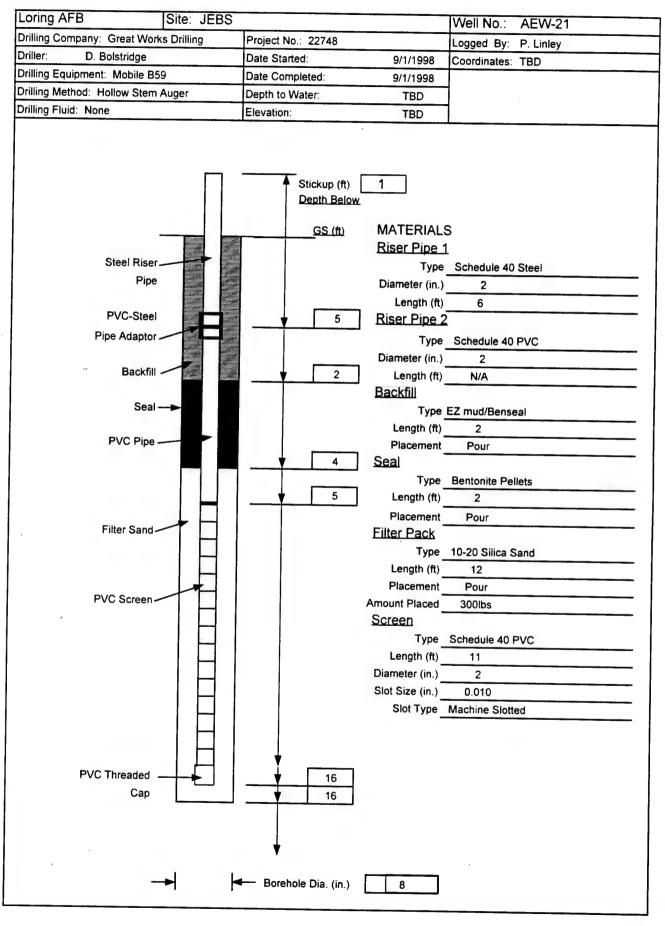
Projec	t Name: Loring AFB				Borehole No.: AEW-19		
	t Number: 22784	Elevation: TBD					
	on: JEBS		tarted:9/		Date Completed: 9/1/98		
Driller:	Great Works Drilling		epth (ft)		17		
			Depth to Bedrock (ft): 17				
Drilling	Method: Hollow Stem Auger		iameter		8		
	Fluid: None		o Water		TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-17ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be		
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
_	poorly sorted, subang to subrd, gvl 4-5 inches in						
	diameter.						
5_	6 7% Cobble						
_	6-7ft: Cobble zone.						
	_						
-							
10							
'~-	-						
-	-						
_	-						
_							
15	-						
	-						
	17ft: Bedrock: Limestone.						
	7			-			
20	, · · · · · · · · · · · · · · · · · · ·						
	1						
	7				Ì		
	·						
25	·						
				İ			
· · -	·						
20-							
30	_			ļ			
-	4	İ					
$ $ $\dashv$	4	ļ					
-	4						



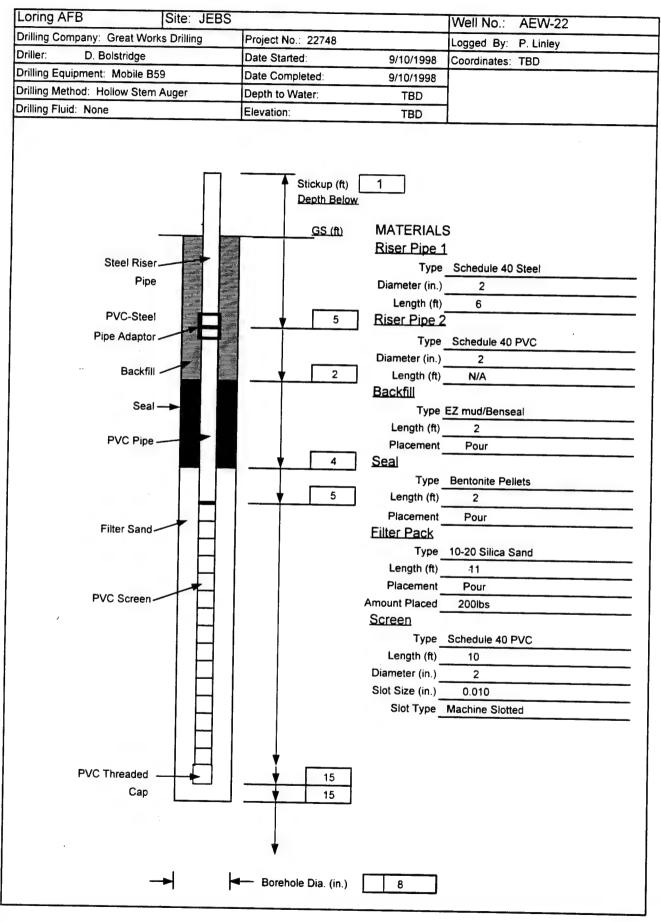
Proje	ct Name: Loring AFB	1			Daniel Al Alexandria			
	ct Number: 22784	Elevati	ion:	TBD	Borehole No.: AEW-20			
	ion: JEBS	Date S	Data Commission of Old Do					
Drille	r: Great Works Drilling		Date Completed: 9/1/98					
	Equipment: Mobile B59			Total Depth (ft): 20 Depth to Bedrock (ft): 20				
Drillin	g Method: Hollow Stem Auger		iameter					
Drillin	g Fluid: None		to Water		8			
Comp	oletion: Completed as a Soil Vapor Extraction Well		By: P.		TBD			
	See Construction Log for details	Logger	т Бу. Р.	Liney				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
-	0-0.5ft: Concrete				No samples required to be			
-	0.5-1ft: Fill - Gravel				collected during installation			
-	1-20ft: Gravelly Clayey Silt: (ML), Lt olive gry							
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.							
_	Jessify sorted, subang to subid.							
_	7ft: Moist.							
-	-							
_								
10	10ft: Clay fraction increase to approx. 20%.		]					
	11ft: Clay fraction decrease to <10%.		j		1			
	12ft: V moist.	]	1					
	-		l					
	-	- 1						
15	+			1				
	+							
$\dashv$	-	]	i		!			
	·		İ	- 1				
	204. B1	1	- 1					
20	20ft: Bedrock: Limestone.	ľ			1			
-	]	1	- 1					
$\dashv$		ŀ						
$\dashv$								
25								
~~								
$\dashv$			1					
$\dashv$		İ						
$\dashv$	_	1						
30	4							
	4							
$\dashv$	4		1					
$\dashv$	4			ł				
	-1							



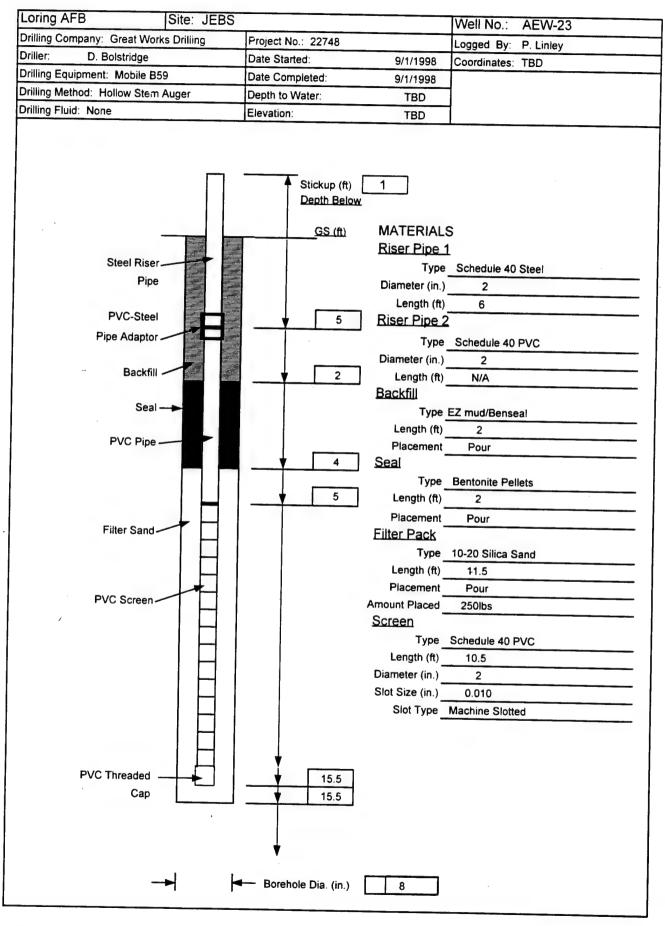
Proiec	et Name: Loring AFB				Porchala No. AFIMO		
	et Number: 22784	Borehole No.: AEW-21 Elevation: TBD					
	on: JEBS	Date Started:9/1/98 Date Completed: 9/1/					
Driller: Great Works Drilling			Total Depth (ft): 16				
Equipment: Mobile B59							
	Method: Hollow Stem Auger	Depth to Bedrock (ft): 16  Hole Diameter (in): 8					
	g Fluid: None		o Water		12		
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.				
	See Construction Log for details			Linioy			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-0.5ft: Concrete				No samples required to be		
_	0.5-1ft: Fill - Gravel				collected during installation		
_	1-8ft: Clayey silty gravel: (GP), Lt olive gry						
5	(5Y6/1) to olive gry (5Y4/1), v fine to coarse,						
~	unconsld, poorly sorted, subang to subrd.						
-							
_	8-16ft: <b>Gravelly clayey silt:</b> (ML), Lt olive gry						
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
10	subang to subrd, v moist to wet, gvl 2-3 inches in						
	diameter.			.			
	11-11.5ft: Cobble zone.			ľ			
	12ft: water, soupy cuttings.			-			
	-						
15				ı			
	16ft: Bedrock: Limestone.		ļ				
	-	ı	ĺ				
	·· .	1		*			
	· 1				ļ		
20_	,						
	7						
_	J	1	l				
_	]	ĺ			j		
25	]				i		
25					ł		
$\dashv$							
_	_	- 1	ĺ				
$\dashv$		ŀ		1			
30	7						
~~	4				ļ		
$\dashv$	·						
$\dashv$	4						
$\dashv$	4						



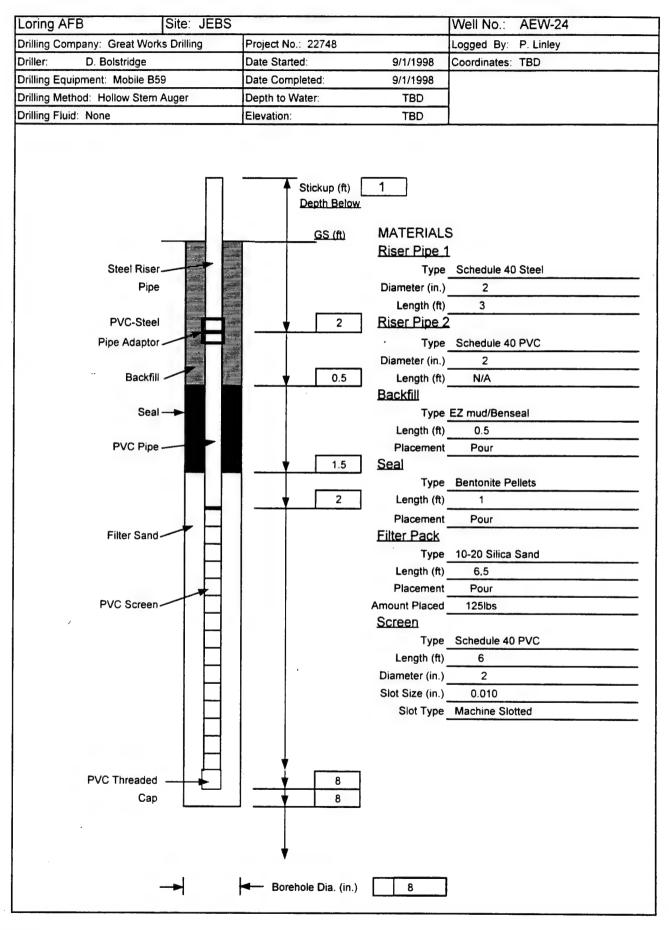
1 Project	ot Name: Loring AFB				Borehole No.: AEW-22	
	ct Number: 22784	Elevati	on:	TBD	Borenole No AEVV-22	
	ion: JEBS				Date Completed: 9/10/98	
	: Great Works Drilling					
	ment: Mobile B59	Total Depth (ft): 15 Depth to Bedrock (ft): 15				
Drilling Method: Hollow Stem Auger						
	g Fluid: None		iameter		8	
			o Water		TBD	
Comp	See Construction Log for details	Logged	IBy: P.	Linley		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
10	0-0.25ft: Asphalt 0.25-1ft: Fill - Gravel 1-15ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.	S	S		No samples required to be collected during installation	



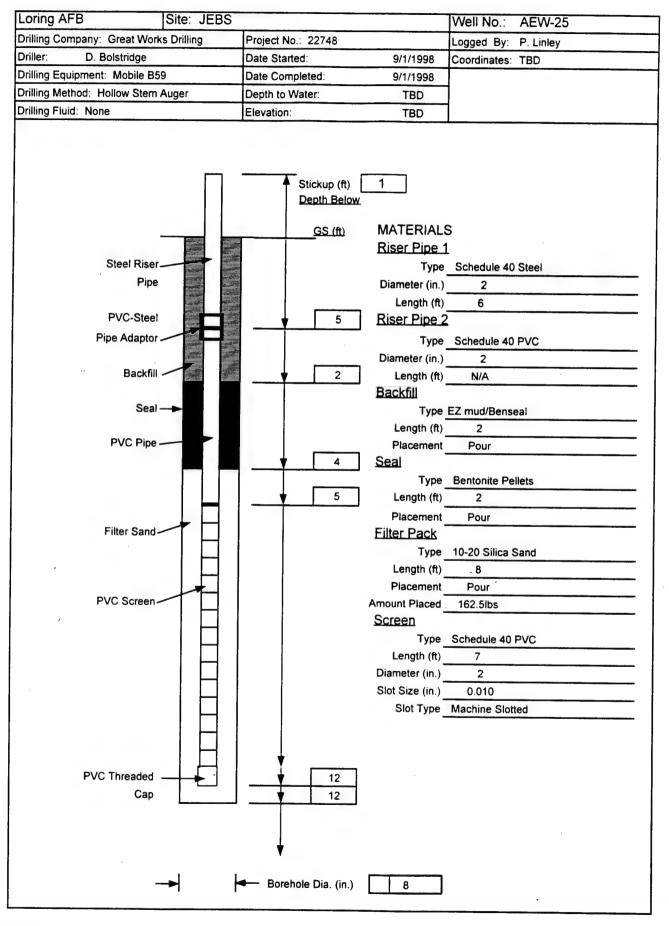
Proiec	et Name: Loring AFB				Parahala Na : AFIM 22	
	et Number: 22784	Elevati	on:	TBD	Borehole No.: AEW-23	
	on: JEBS	Date Started: 9/1/98 Date Completed: 9/1/				
	Great Works Drilling					
	ment: Mobile B59					
	Method: Hollow Stem Auger	Depth to Bedrock (ft): 15 Hole Diameter (in): 8				
	g Fluid: None		o Water		TBD	
	letion: Completed as a Soil Vapor Extraction Well		By: P.		WENT TO THE PARTY OF THE PARTY	
	See Construction Log for details					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
-	0-15.5ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
_	poorly sorted, subang to subrd.					
5	_					
\ \ \ \ \ \ \	-					
-	<b>√</b>					
-	-	,			<u> </u>	
_	-				İ	
10	-					
-	-					
	· -					
_	4				·	
15	15.5ft: Bedrock: Limestone.			İ		
	-		-	1	·	
	-		Ì			
	i			•		
	. 🖣					
20	7	i	.			
	7		ı			
	٦	l	l			
_		l	٠. ا			
	]			ĺ		
25						
_	_			l	İ	
	]					
_	$oxed{J}$	- 1				
20-		- 1				
30						
_	]	İ				
_						
-		- 1				



Projec	t Name: Loring AFB				Borehole No.: AEW-24		
Projec	t Number: 22784	Elevation: TBD					
Location	on: JEBS	Date S	tarted:9/	1/98	Date Completed: 9/1/98		
Driller:	Great Works Drilling	Total Depth (ft): 8					
Equip	ment: Mobile B59	Depth to Bedrock (ft): 8					
Drilling Method: Hollow Stem Auger			Hole Diameter (in): 8				
	g Fluid: None	Depth t	o Water	(ft):	TBD		
Compl	etion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	I By: P.	Linley	·		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-8ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation		
-	poorly sorted, subang to subrd.						
5	_						
Ĭ <b>-</b>							
	7ft: Cobble zone.				Auger refusal at 7ft,		
_	8ft: Bedrock: Limestone.				relocated approximately		
=					4ft west of oringinal		
10	- · · · · · · · · · · · · · · · · · · ·				location.		
_	·						
	· ¬						
	7						
15					·		
	]						
_	_						
~ <u>~</u>	4						
20-	<i>'</i>						
_	· -						
-	-						
$\dashv$	4						
25	-						
-	- ·						
-	-	l			ì		
	-			Ì			
	-	İ					
30	-						
-	┪						
	4						
	. 1						
	_						



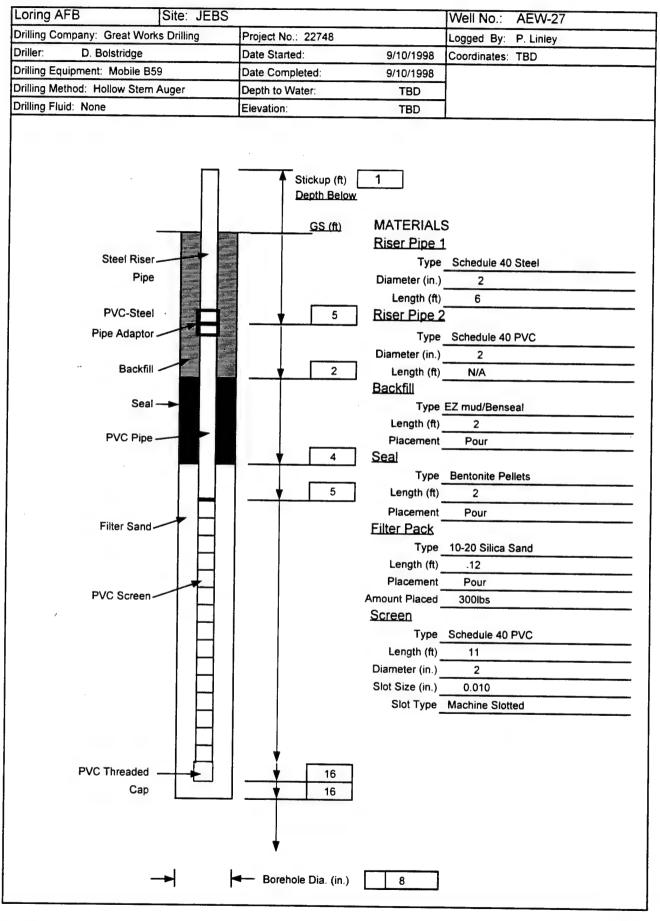
Projec	t Name: Loring AFB				Borehole No.: AEW-25		
	t Number: 22784	Elevation: TE					
	on: JEBS	Date St	arted:9/	1/98	Date Completed: 9/1/98		
	Great Works Drilling		epth (ft):		12		
	ment: Mobile B59		o Bedro	<u> </u>	12		
	g Method: Hollow Stem Auger		ameter (		8		
	g Fluid: None		o Water		TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10	0-12ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl to 6 inches in diameter.  5-5.5ft: Cobble zone.	SOZ	S	<b>M</b>	No samples required to be collected during installation		



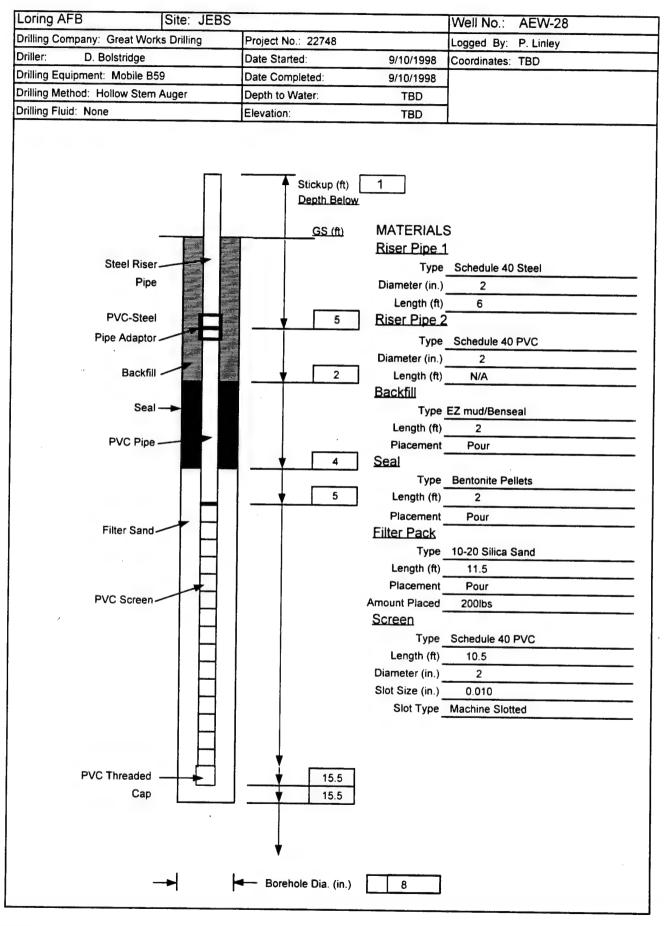
Projec	t Name: Loring AFB				Borehole No.: AEW-26			
	t Number: 22784	Elevation	on:	TBD				
	on: JEBS	Date Started:9/1/98 Date Completed: 9/1/98						
	Great Works Drilling	Total Depth (ft): 15						
Equipment: Mobile B59			Depth to Bedrock (ft): 15					
Drilling Method: Hollow Stem Auger			ameter		8			
	Fluid: None		o Water		TBD			
Compi	etion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments			
	0-0.5ft: Concrete				No samples required to be			
_	0.5-1ft: Fill - Gravel				collected during installation			
_	1-15ft: Gravelly clayey silt: (ML), Lt olive gry							
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.							
~-	poorly softed, subang to subid.							
-	-							
_	-							
-	-							
10	7							
	1			•				
	7							
	]							
15	15ft: Bedrock: Limestone.							
	]							
20								
20-								
	4							
l ⊢	, , <b>-</b>							
	·							
25	-							
	- 1							
	·							
	· 1							
	7							
30	]							
	]							
	_							
L								

Proje	ct Name: Loring AFB						
Project Number: 22784			Borehole No.: AEW-39				
Location: JEBS			Elevation: TBD  Date Started:9/3/98 Date Completed: 9				
Driller: Great Works Drilling					Date Completed: 9/3/98		
	ment: Mobile B59		Depth (ft,		24		
	g Method: Hollow Stem Auger	Depth to Bedrock (ft)			: 24		
	g Fluid: None	Hole Diameter (in):			8		
		Depth to Water (ft):			TBD		
	eletion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged By: P. Linley					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
-	0-0.25ft: Asphalt				No samples required to be		
_	0.25-0.75ft: Fill - Gravel				collected during installation		
-	0.75-24ft: Gravelly clayey silt: (ML), Lt olive gry		ł				
5	(5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsid						
"-	poorly sorted, subang to subrd.			1 1			
_							
_					1		
				ļ			
40-					ľ		
10_					İ		
		l			1		
		- 1	ŀ				
					i		
45			ł		i		
15_	7				ĺ		
_	7		1	ł			
	7	}	i				
	7	ŀ	İ	ł			
	7		ĺ				
20	7						
4	7		ĺ	ł	•		
_	7						
4					1		
	24ft: Bedrock: Limestone.	ł	İ				
25			- 1				
	1		1				
$\exists$	7						
	7				İ		
	1	- 1	1				
30	1		- 1				
	4			-			
	+		ł				
			1				
	_		-				

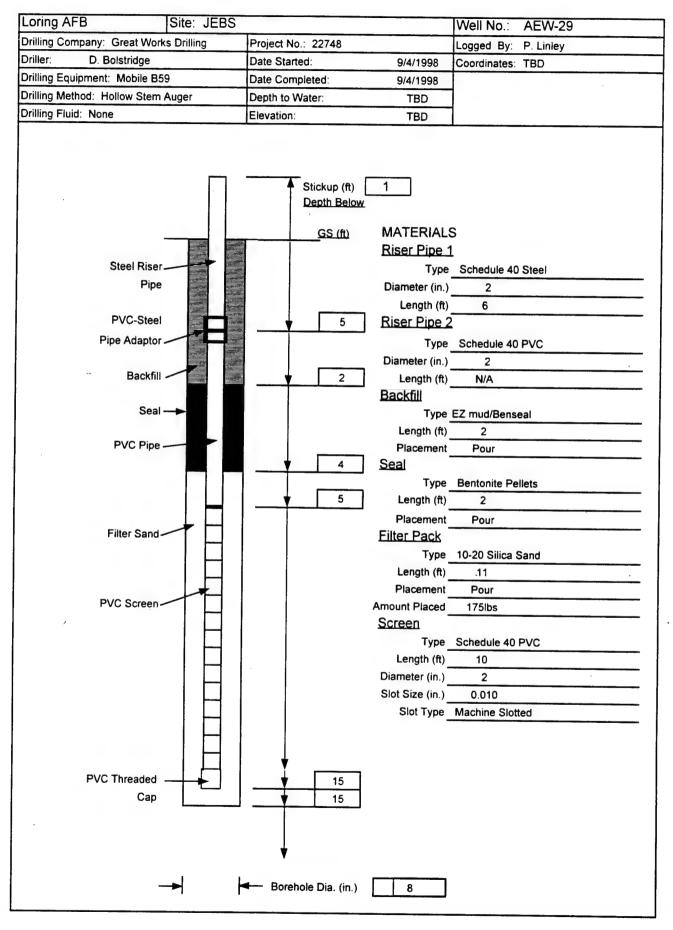
Project Name: Loring AFB		,		Borehole No.: AEW-27		
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started:9/10/98 Date Completed: 9/10/98				
Driller: Great Works Drilling		epth (ft):		16		
Equipment: Mobile B59	Depth	to Bedro	ck (ft):	16		
Drilling Method: Hollow Stem Auger		iameter (		8		
Drilling Fluid: None		Depth to Water (ft):		TBD		
Completion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley			
Description  0-0.6ft: Concrete	Sample Number	Sample Type	Blow Count	Comments		
0.6-8ft: Fill - Gravel				No samples required to be collected during installation		
8-16ft: <b>Gravelly clayey silt:</b> ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd.						
15 16ft: Bedrock: Limestone.						
20						
25	·					
30						



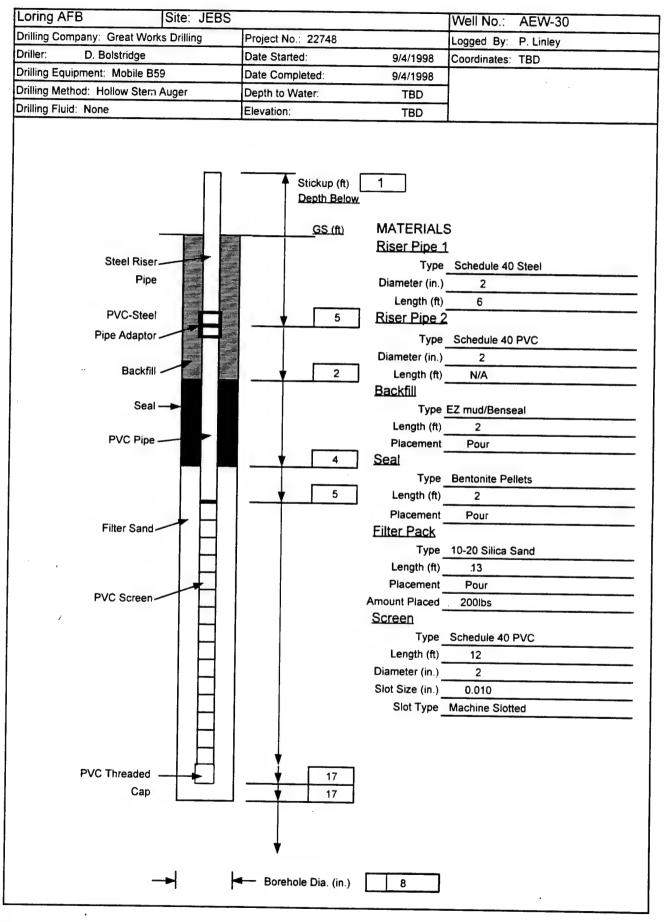
Projec	et Name: Loring AFB						
Project Number: 22784		Borehole No.: AEW-28					
Location: JEBS			Elevation: TBD				
Driller: Great Works Drilling		Date S	tarted:9/	10/98	Date Completed: 9/10/98		
	Equipment: Mobile B59		epth (ft)		15.5		
			to Bedro		15.5		
	g Method: Hollow Stem Auger	Hole Diameter (in):			8		
	g Fluid: None	Depth to Water (ft):			TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley		Linley			
	See Construction Log for details						
				ŧ			
Depth (ft)	Depariation	0 5	0	on O			
뒴	Description	اع م	ا ق ا	>	Comments		
De		Sample Number	Sample Type	Blow Count			
	0-0.25ft: Asphalt	0) 2	<i>ω</i> ⊢	ш	No complex required to be		
	0.25-1: Fill - Gravel				No samples required to be		
=	1-15.5ft: Gravelly clayey silt: (ML), Lt olive gry		•		collected during installation		
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
5	poorly sorted, subang to subrd.						
_	-						
-	· · · · · · · · · · · · · · · · · · ·						
-	-						
	-			j			
10	4				1		
_	· -						
-	· -				·		
-	·						
	4				1		
15	15.5ft: Bedrock: Limestone.	]	ĺ		j		
'˘-	Limestone.	İ			ĺ		
-							
$\vdash$	·						
$\dashv$					•		
20-				ĺ			
20	,	ŀ	l				
-		-	ŀ	- 1			
$\dashv$			ļ	1			
_	_						
<u></u>	]	- 1					
25	·		]		İ		
_	7		1				
4	7	1					
	7	- 1					
	٦		İ				
30	7						
	7	ŀ					
	· – – – – – – – – – – – – – – – – – – –	-	- 1		1		
	₫						
	-						



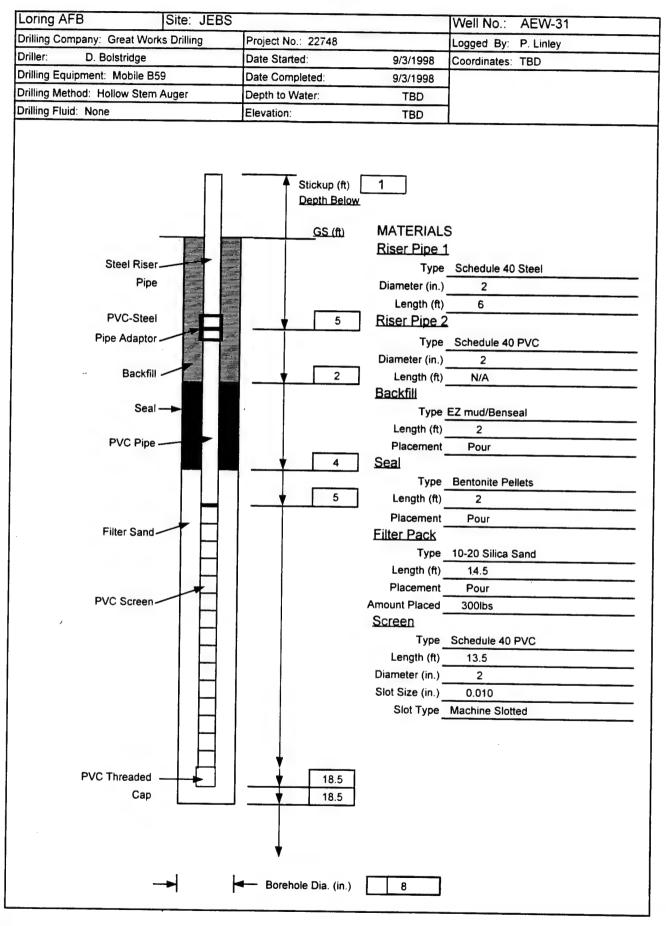
Proied	et Name: Loring AFB	T			Parahala Na : AFIA/20	
Project Number: 22784		Borehole No.: AEW-29 Elevation: TBD				
Location: JEBS		Date Started: 9/4/98   Date Completed: 9/4/98				
Driller.	: Great Works Drilling		epth (ft)		15	
	ment: Mobile B59					
	g Method: Hollow Stem Auger	Depth to Bedrock (ft) Hole Diameter (in):			8	
	g Fluid: None	Depth to Water (ft):			TBD	
	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details	209900		Liney		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
	0-1ft: Concrete				No samples required to be	
_	1-13ft: Fill - Gravel				collected during installation	
10 1 1 20 1 30 1 30 1 30 1 30 1 30 1 30	13-15ft: <b>Gravelly clayey silt</b> : ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd. 15ft: <b>Bedrock</b> : Limestone.					



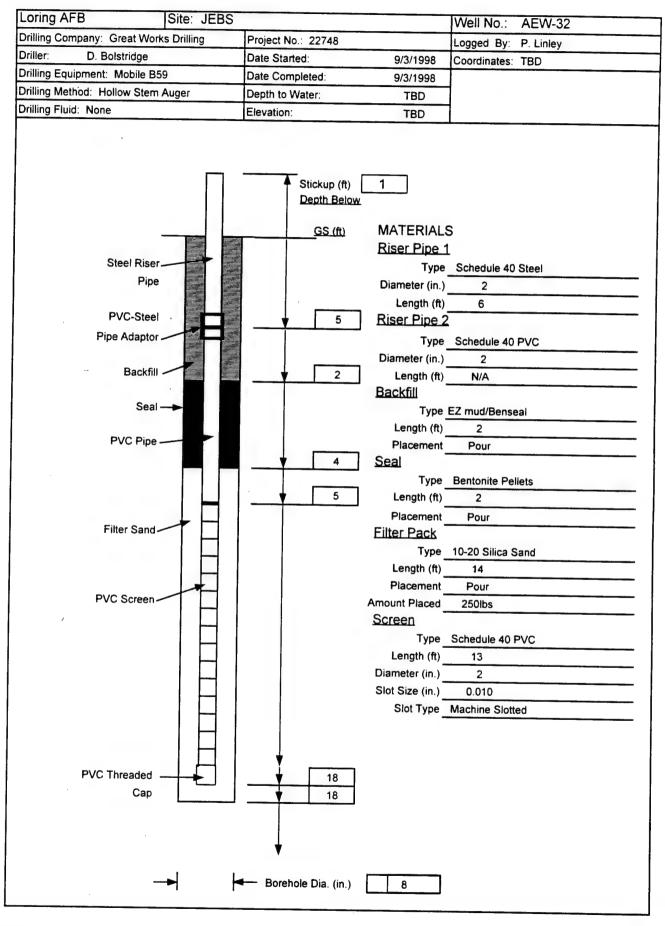
Projec	et Name: Loring AFB	1			ID		
Project Number: 22784			Borehole No.: AEW-30				
Location: JEBS			Elevation: TBD  Date Started: 9/4/98   Date Completed: 9/4/98				
Driller: Great Works Drilling					Date Completed: 9/4/98		
	Equipment: Mobile B59		epth (ft)		17		
			to Bedro				
	g Method: Hollow Stem Auger	Hole Diameter (in):			8		
	g Fluid: None	Depth to Water (ft):			TBD		
Comp	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	d By: P.	Linley			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
_	0-1ft: Concrete				No samples required to be		
] _	1-6ft: Fill - Gravel	]			collected during installation		
_							
5-							
"-	6 17th Crowelly elements to describe						
_	6-17ft: Gravelly clayey silt: (ML), Lt olive gry						
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
_	poorly sorted, subang to subrd.						
10							
''-	·						
_	_						
_	<u> </u>						
_	_				_		
15							
'~-	4	l					
_	476. Dadamid 11.	:					
	17ft: Bedrock: Limestone.						
-				1			
20-	_						
20	,						
$\dashv$							
_		- 1	1				
-							
25	_						
23							
-							
$\dashv$			i				
$\dashv$	. 🗕			1			
30	·				•		
30—		Ì			<b>İ</b>		
$\dashv$			- 1				
$\dashv$							
$\dashv$							



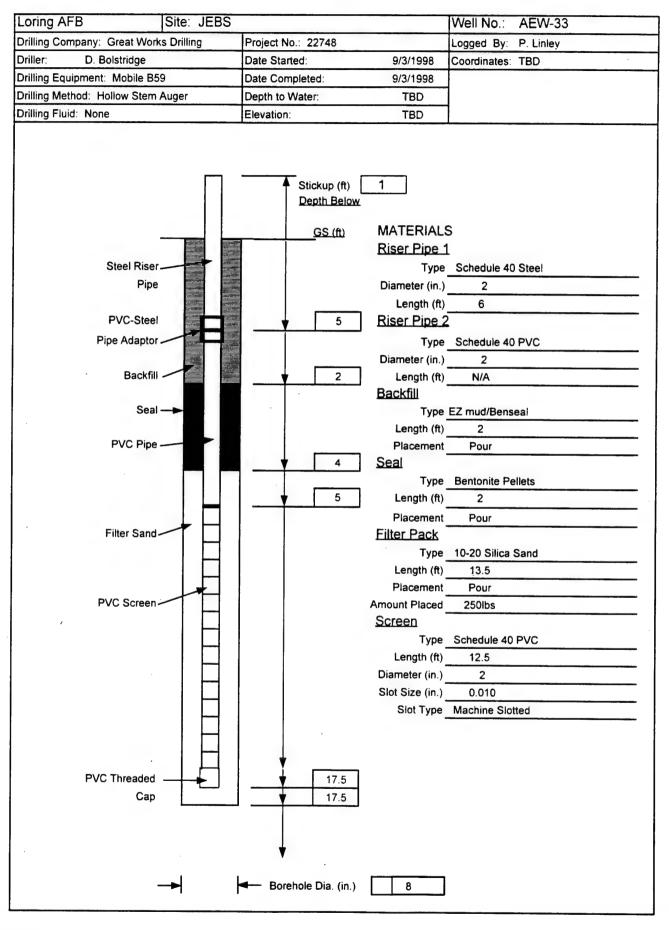
Proje	ct Name: Loring AFB		-		Borehole No.: AEW-31	
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started:9/3/98			Date Completed: 9/3/98	
Driller: Great Works Drilling			epth (ft)		18.5	
Equip	ment: Mobile B59		to Bedro			
Drillin	g Method: Hollow Stem Auger		iameter		8	
Drillin	g Fluid: None		o Water		TBD	
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
10	0-18.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.				No samples required to be collected during installation Relocated approximately 10ft east of original location to allow for rig access.	



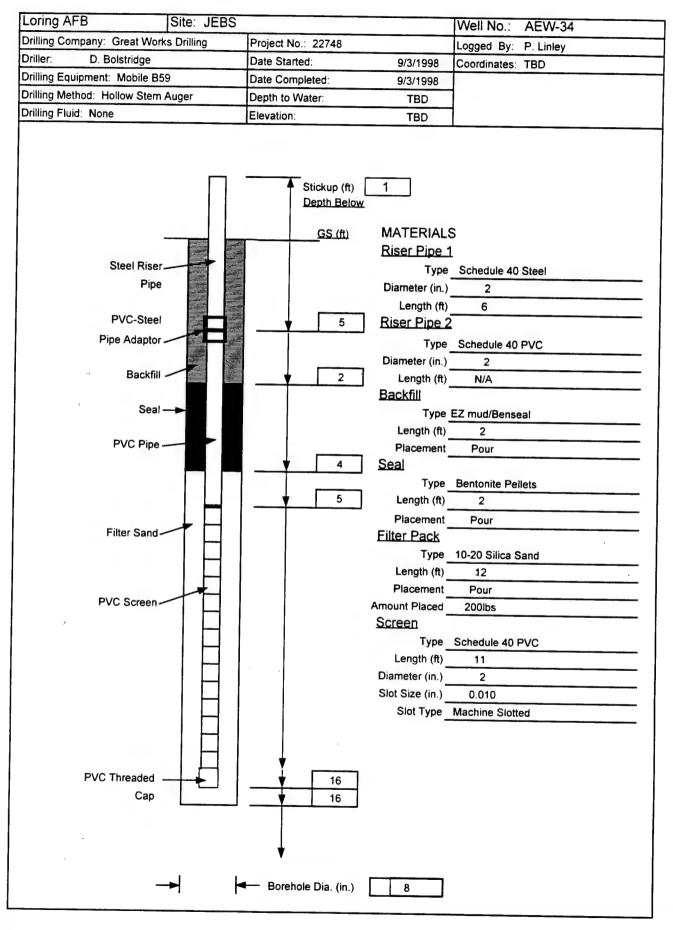
Projec	et Name: Loring AFB				Borehole No.: AEW-32	
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started:9/3/98   Date Completed: 9/3/98				
Driller: Great Works Drilling		Total Depth (ft):			18	
Equipment: Mobile B59		Depth to Bedrock (ft).				
Drilling	g Method: Hollow Stem Auger	Hole Diameter (in):			8	
	g Fluid: None	Depth to Water (ft):			TBD	
Comp	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details			,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
	0-0.5ft: Concrete	0, 2	0,		No samples required to be	
	0.5-1ft: Fill - Gravel				collected during installation	
_	1-18ft: Gravelly clayey silt: (ML), Lt olive gry				3	
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid					
5_	poorly sorted, subang to subrd.					
_						
_						
	_				1	
10-						
10_	_					
_	4					
_	_			ĺ		
_	4					
15						
· · · —	4					
_	_					
_	18ft: Bedrock: Limestone.					
_	Total Bodison. Elificatorie.				·	
20	<b>-</b>					
_	<i>'</i>	l				
	+			l		
	. · · · · ·			.	İ	
	d		]	i		
25			İ		···	
			ŀ			
	7					
	†	.				
	Ţ	ŀ				
30	٦					
	٦					
	٦					
	]					



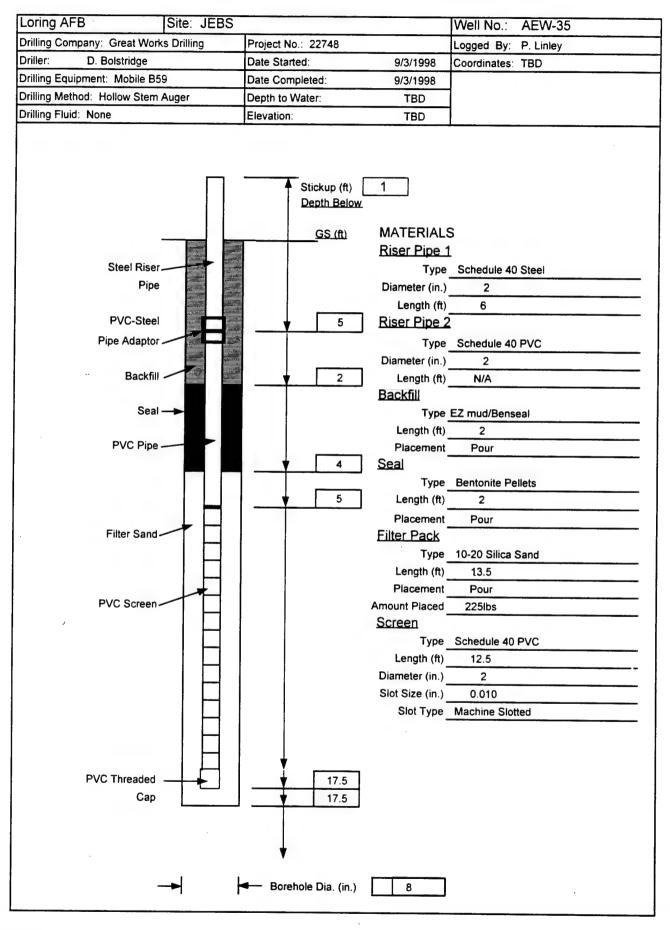
Projec	ct Name: Loring AFB	Т			I Donata I A Sint Co	
	ot Number: 22784	Elevati	on:	TDD	Borehole No.: AEW-33	
	ion: JEBS	Elevation: TBD  Date Started:9/3/98   Date Completed: 9/3/98				
	: Great Works Drilling				Date Completed: 9/3/98	
	ment: Mobile B59		epth (ft)		18.5	
	g Method: Hollow Stem Auger		to Bedro			
	g Fluid: None		iameter		8	
			o Water		TBD	
Comp	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	By: P.	Linley		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
	0-0.5ft: Concrete	S Z	Ø ⊢	8	N	
10 15 1 20 1 30 1 30 1	0.5-1ft: Concrete 0.5-1ft: Fill - Gravel 1-18.5ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.				No samples required to be collected during installation	
_						



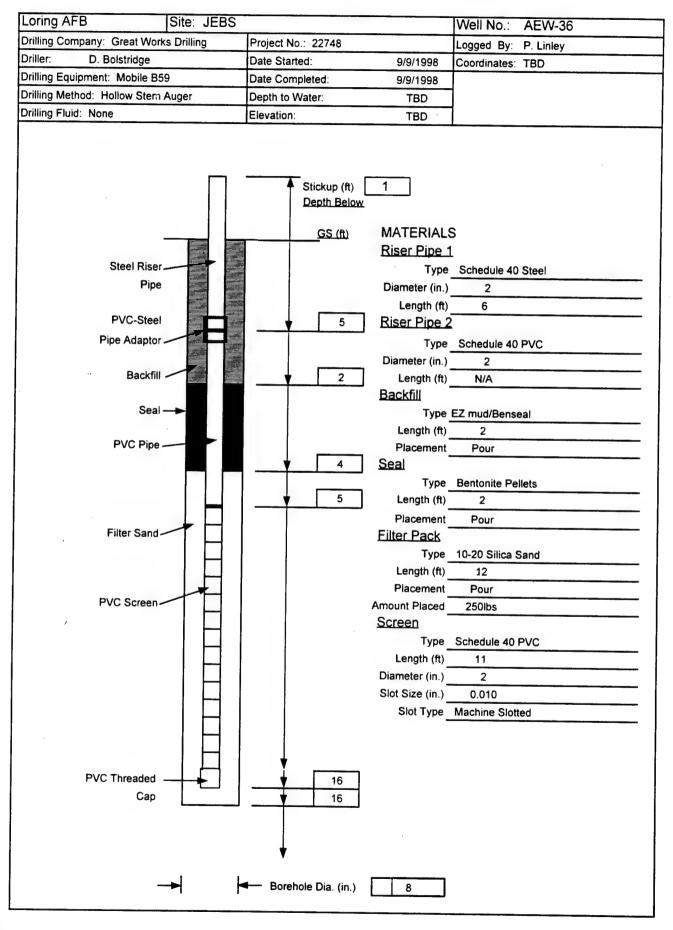
Projec	ct Name: Loring AFB				Borehole No.: AEW-34
	ct Number: 22784	Elevati	on:	TBD	
Locati	ion: JEBS	Date S	tarted:9/	3/98	Date Completed: 9/3/98
Driller	: Great Works Drilling		epth (ft)		16
Equip	ment: Mobile B59		o Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		TBD
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details	33			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-1ft: Concrete				No samples required to be
_	1-2ft: Fill - Gravel				collected during installation
_	2-16ft: Gravelly clayey silt: (ML), Lt olive gry				
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				
<sup>5</sup> _	poorly sorted, subang to subrd.				
_	· ·				
_					•
_					
40-					
10_					
_	·				
_					
-					
	·				
15				Ì	
	16ft: Bedrock: Limestone.				
	7				
_				-	•
	]			ļ	
·20_	Ι,			ĺ	
	7				
	7				
	1				
	1	1		}	•
25	7		ļ	İ	
	1	l			
	7				
		į			
	1				
30 ]					
			ŀ	ļ	
	<b>-</b>	l			
		Ì	ļ		
$\dashv$	. 4		i		
l					



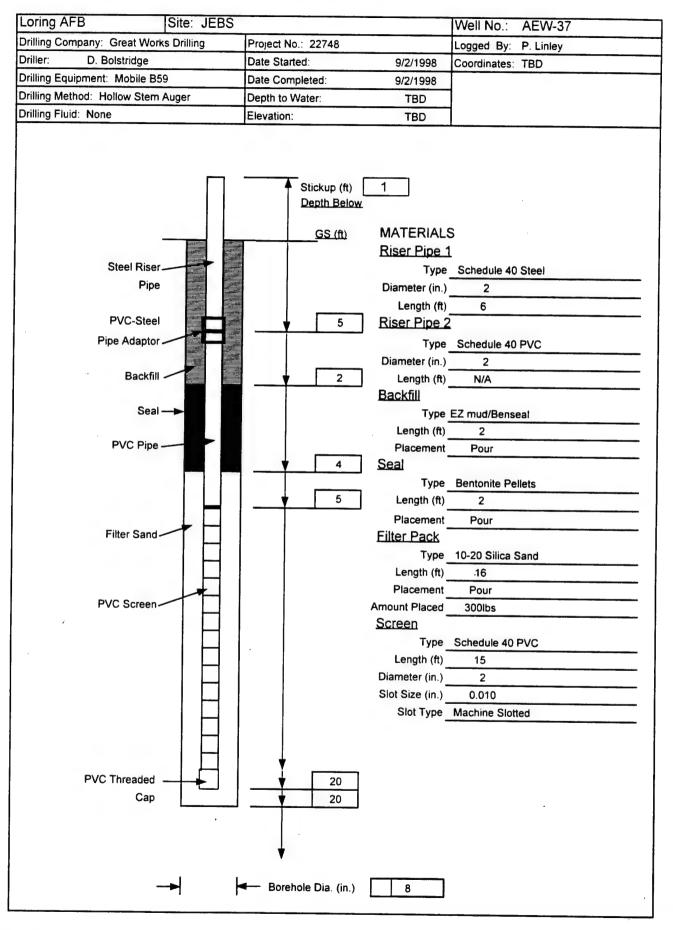
Projec	t Name: Loring AFB				Borehole No.: AEW-35
	t Number: 22784	Elevati	on:	TBD	DOTOTION TVO AEVV-30
	on: JEBS		tarted:9/		Date Completed: 9/3/98
Driller:	Great Works Drilling		epth (ft)		17.5
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger		iameter		8
	Fluid: None		o Water		TBD
Compl	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details		,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-17.5ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
-	poorly sorted, subang to subrd.				
5	-				)
~ <b>_</b>	-				
-					
-	-				
-	-				•
10	-				
_	-				
	. <b>-</b>				
	4	J			
15		i		ł	
			i		
	17.5ft: Bedrock: Limestone.	ļ		ĺ	
		Ì		•	
			}		
20_	,		Ì		
$\dashv$	]		ł	ĺ	
		ĺ	I		
		l	f		
25			]	i	ŀ
<sup>23</sup> –	· 4				
$\dashv$	4				
_	4				·
$\dashv$	4			l	
30	4				
-	4				
$\dashv$	·		Ī		
$\dashv$	· -				
	4		ı		



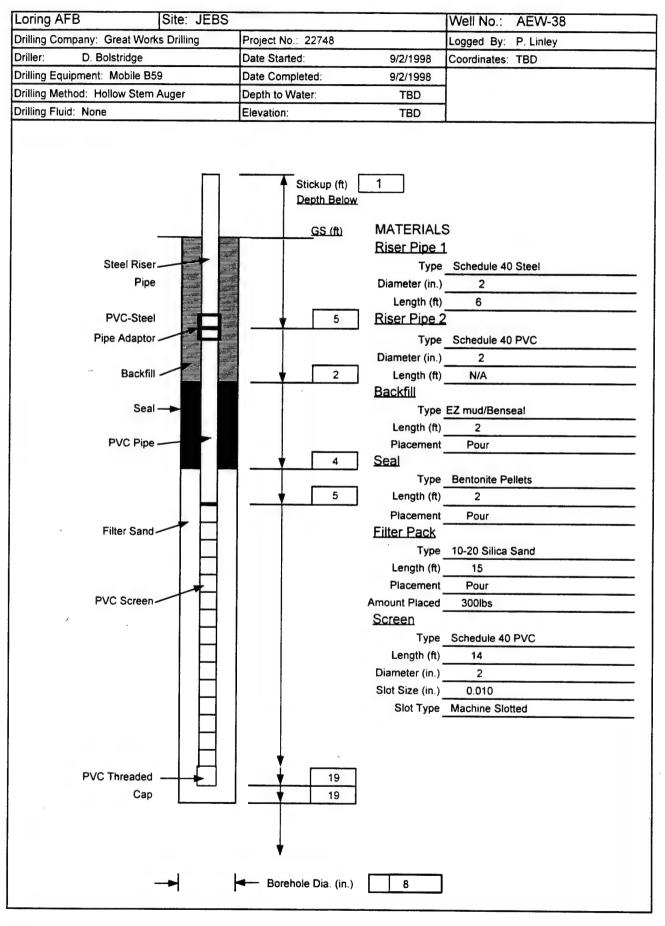
Projec	et Name: Loring AFB	T :			Borehole No.: AEW-36
	ct Number: 22784	Elevati	on:	TBD	
	on: JEBS	Date S	tarted:9/		Date Completed: 9/9/98
Driller	: Great Works Drilling		epth (ft)		16
Equip	ment: Mobile B59		to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter	_ ` /	8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details		,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-16ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid_		1		collected during installation
_	poorly sorted, subang to subrd.	1			
	_		1		. •
5_	_				
_	_				
-	· -				
	_				
10	_				
	<u>-</u>				
_	<b>-</b>				•
_	_				
_	_	,			
15					
_	16ft: Bedrock: Limestone.				
_	- Entertaine				
_	-			-	
_	·				
20	,				
	=				
	·				
	-				
	· · · · · · · · · · · · · · · · · · ·				
25	7				
	· -	i			
	7				
	7				
	7			1	
30	· 1		İ	J	
	7				
	7	1	l		
				- 1	
	· · ·				



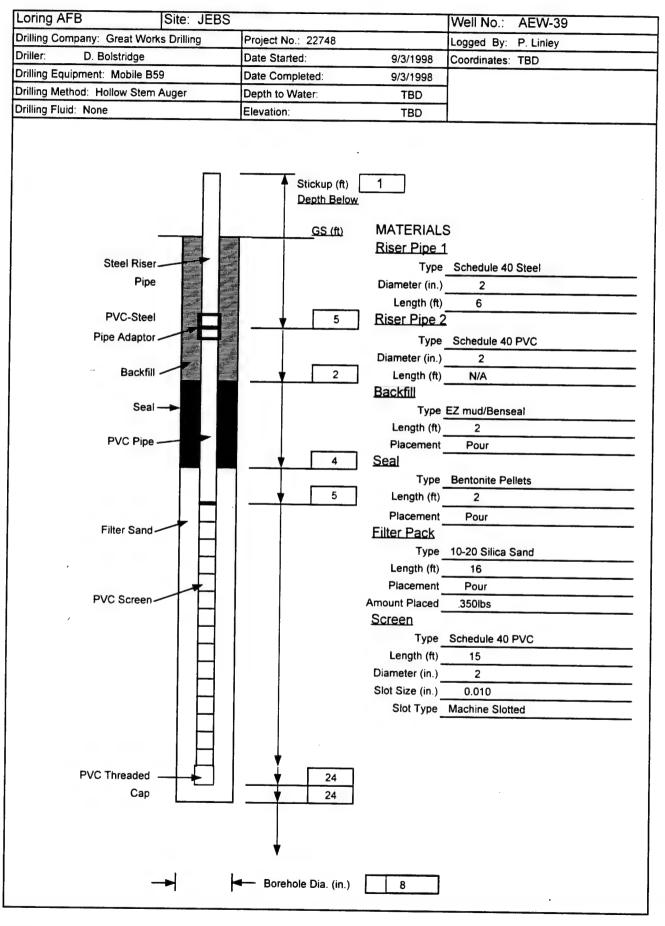
Project Name: Loring AFB				Borehole No.: AEW-37
Project Number: 22784	Elevati	ion:	TBD	DOTOTION TO TIETY OF
Location: JEBS	Date S	tarted:9/	2/98	Date Completed: 9/2/98
Driller: Great Works Drilling	Total D	epth (ft)	:	20
Equipment: Mobile B59	Depth	to Bedro	ck (ft):	20
Drilling Method: Hollow Stem Auger	Hole D	iameter	(in):	8
Drilling Fluid: None	Depth	to Water	(ft):	TBD
Completion: Completed as a Soil Vapor Extraction Well	Logged	By: P.	Linley	
See Construction Log for details				
Description (f)	Sample Number	Sample Type	Blow Count	Comments
	Sar	Sar	읆	
0-20ft: <b>Gravelly clayey silt</b> : ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.  5  10  20  20ft: <b>Bedrock</b> : Limestone.		S .		No samples required to be collected during installation



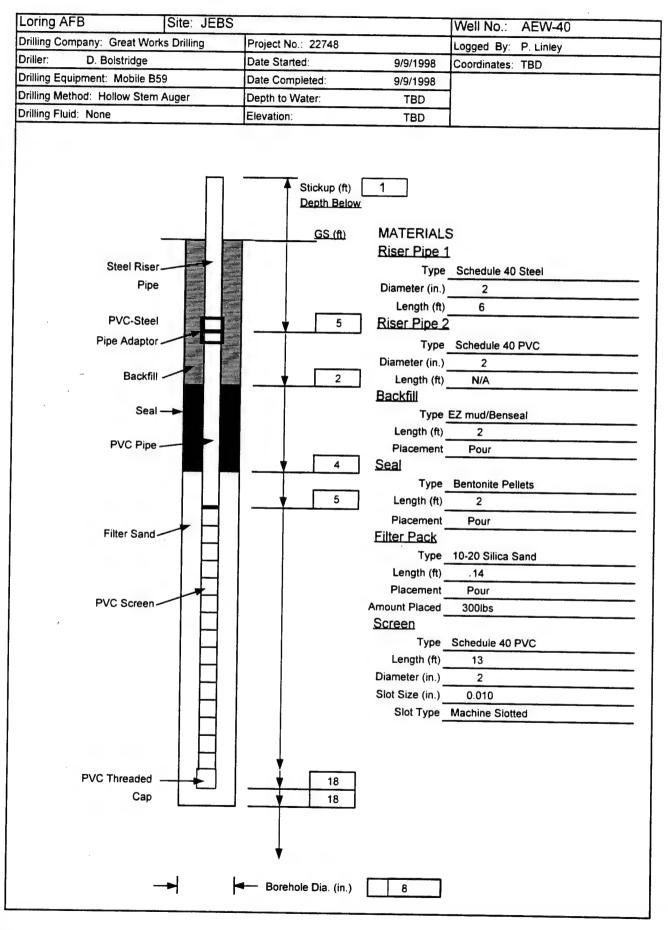
Projec	t Name: Loring AFB				Borobolo No : AEIA/ 29
	t Number: 22784	Elevati	on.	TBD	Borehole No.: AEW-38
Locati	on: JEBS		tarted:9/		Date Completed: 9/2/98
Driller.	Great Works Drilling		epth (ft)		19
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger		iameter		8
	r Fluid: None		o Water		TBD
Compl	etion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details			,	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-19ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
-	poorly sorted, subang to subrd.				
5	5ft: Moist.				
~	ort. Moist.				
_	<b>-</b>				
-	·				
. –	-				
10	· -				
	4				
	-		1		
	·				
	1			•	
15	1	]			
	· 1	- 1	İ		
		Ì			
_	10%			- 1	
	19ft: Bedrock: Limestone.		. 1		
20	,	ĺ	l	- 1	
-	·		l		
$\dashv$	. ·				
	·				
25	-				
-				]	
$\exists$	·	į		.	
7	4	İ		}	
	4				
30	·				
	+	- 1	1		



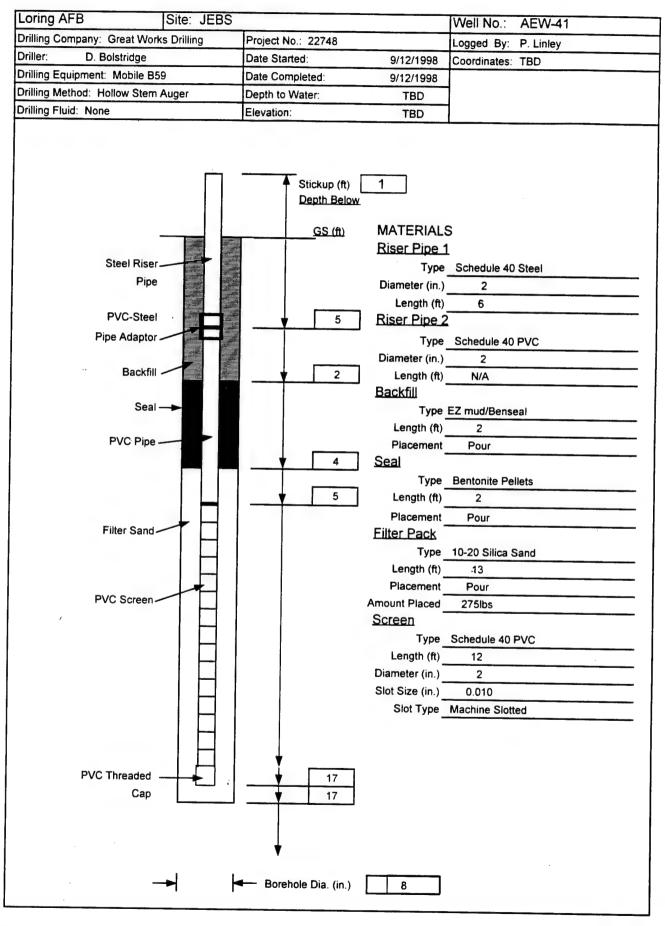
Projec	t Name: Loring AFB	1			Dorohala Maria A Elevico
	t Number: 22784	Elevati	on:	TBD	Borehole No.: AEW-39
	on: JEBS				15 1 6 1 1 1 5 5 5
			tarted:9/		Date Completed: 9/3/98
	Great Works Drilling		epth (ft)		24
	ment: Mobile B59		o Bedro		24
	Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		TBD
Compi	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	IBy: P.	Linley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-0.25ft: Asphalt				No samples required to be
	0.25-0.75ft: Fill - Gravel				collected during installation
	0.75-24ft: <b>Gravelly clayey silt:</b> (ML), Lt olive gry				
_	(5Y6/4) to olive gry (5Y4/1), v fine to fine, unconsid				
5_	poorly sorted, subang to subrd.				
					·
	· · ·				
	7				
10					
				·	
	·				
	1				
	·				
15	7				
	7				
1,244	<b>1</b>				· .
	7			-	
	7				
20	7				
	<b>1</b>				
	4				i
	24ft: Bedrock: Limestone.		i		*
25	-				
		1	Ì		
$\dashv$	4				
	·		1		
$\dashv$	+				
30	4	- 1			
$\dashv$	4				
$\dashv$	4		į		
$\dashv$	4			1	
-	4	İ			
1					



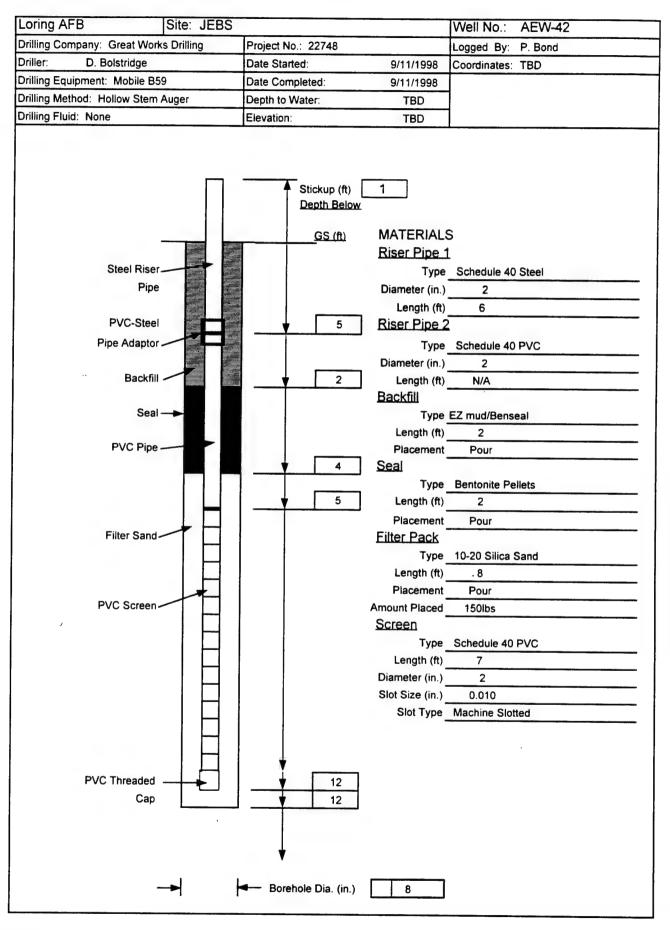
Projec	ct Name: Loring AFB				Borehole No.: AEW-40	
Projec	ct Number: 22784	Elevation: TBD			Doronoic No.: ALVV-40	
Locati	ion: JEBS		tarted:9/		Date Completed: 9/9/98	
Driller	: Great Works Drilling	Total Depth (ft): 18				
	ment: Mobile B59		to Bedro			
Drilling	g Method: Hollow Stem Auger		iameter		8	
	g Fluid: None		to Water		TBD	
	letion: Completed as a Soil Vapor Extraction Well		By: P.			
	See Construction Log for details	209900		Liney		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-18ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld				collected during installation	
_	poorly sorted, subang to subrd.					
	]					
5_						
i –	· ·					
_	96. V				İ	
_	8ft: V moist to wet.				ĺ	
40-						
10_						
_						
	12ft: Clay fraction increase to 15%.					
_		,		ĺ		
45			İ			
15_	·	ĺ	ł			
_						
_			ĺ			
	18ft: Bedrock: Limestone.	ĺ		· ]		
~ <u>~</u>				.		
20-	,	ŀ				
$\dashv$	]	1				
_	]					
-			ļ	. [	İ	
~- <del>-</del>	·			1	i	
25			-			
_			İ			
4	]					
	]	]	1		ļ	
$\sim$	]	1				
30			ļ			
	. 7			- 1		
	7					
	7					



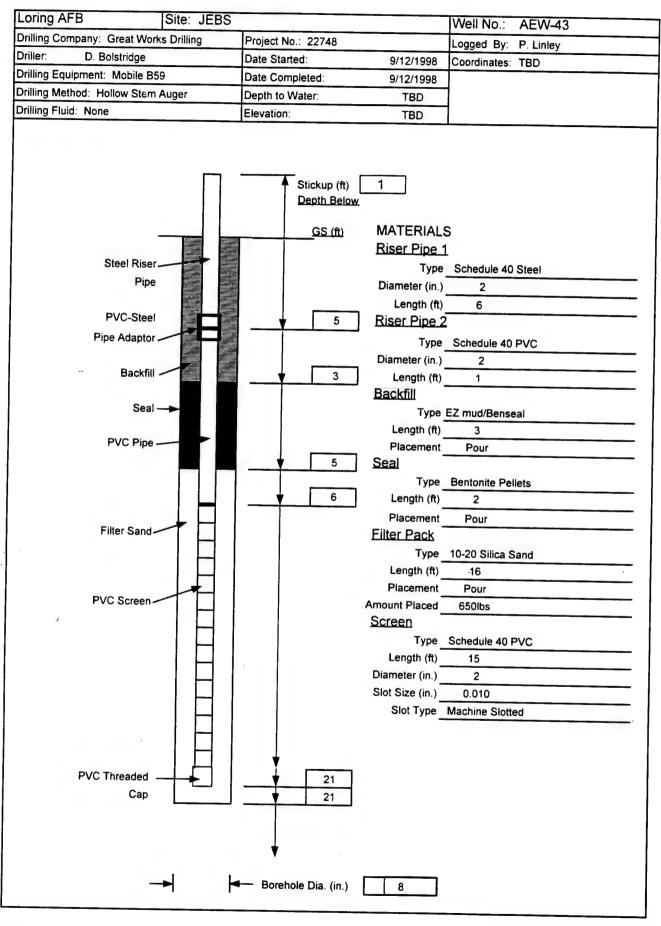
Projec	et Name: Loring AFB			•	Borehole No.: AEW-41
	et Number: 22784	Elevati	on:	TBD	DOIGHOIG NO ALVV-4
	on: JEBS				Date Completed: 9/12/98
Driller.	Great Works Drilling		epth (ft).		17
	ment: Mobile B59		o Bedro		
	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		TBD
	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details	- 33 -			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-17ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
_	poorly sorted, subang to subrd.				
	_				
5_					
_					
_					
_	_				
1 40-					
10_					
_					
_					
_	_				
15	_				
19—					·
_	476				
_	17ft: Bedrock: Limestone.			.	•
-					
20	_				
<sup>20</sup> –	_		}		
$\dashv$					
• -					
	4		j	1	
25	_	l			
<sup>23</sup> -		ĺ	ł		
-	·				
$\dashv$					
$\dashv$	4				
30	4				
~~	_				
$\dashv$		İ			
$\dashv$					
$\dashv$	·				



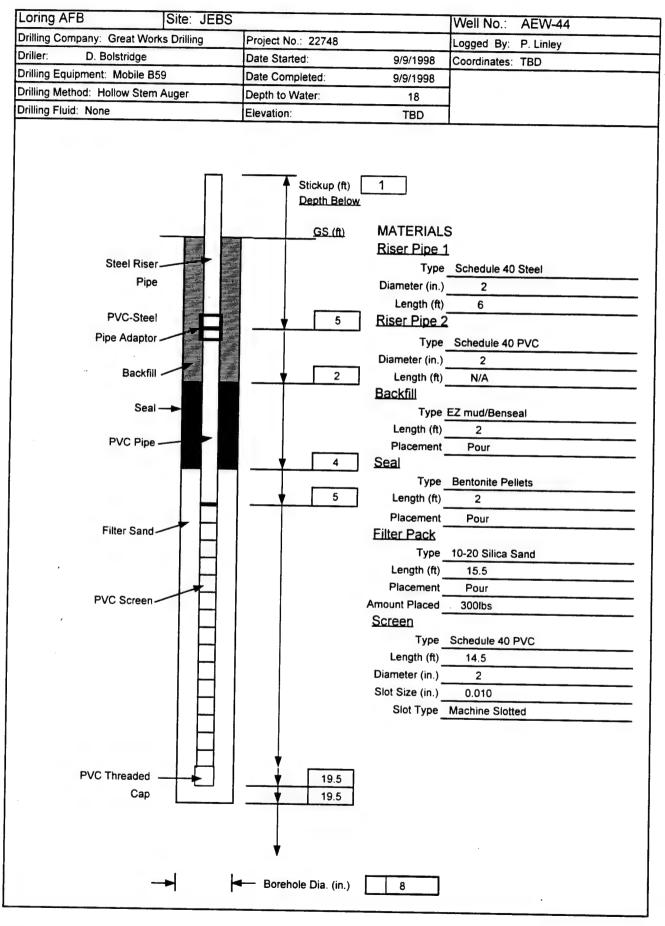
Projec	t Name: Loring AFB				
	Davis - A Alexandra - COCCA			TDD	Borehole No.: AEW-42
	on: JEBS			TBD	10.1.0
	Great Works Drilling	Date Started:9/11/98 Date Completed: 9/11/98 Total Depth (ft): 12			
	ment: Mobile B59				12
	g Method: Hollow Stem Auger		to Bedro		
	g Fluid: None		iameter		8
			to Water		TBD
Compi	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	i By: P.	Bond	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-12ft: Gravelly silt/clay w/sand: (ML), olive gry				No samples required to be
10 115 1 20 1 30 1 30 1	(5Y4/1), gravels , 1cm mostly rounded, Larger ones mostly angular, moist to dry soils, w/depth color becomes intermingeld w/mod olive brn (5Y4/4).  12ft: Bedrock: Limestone.				collected during installation



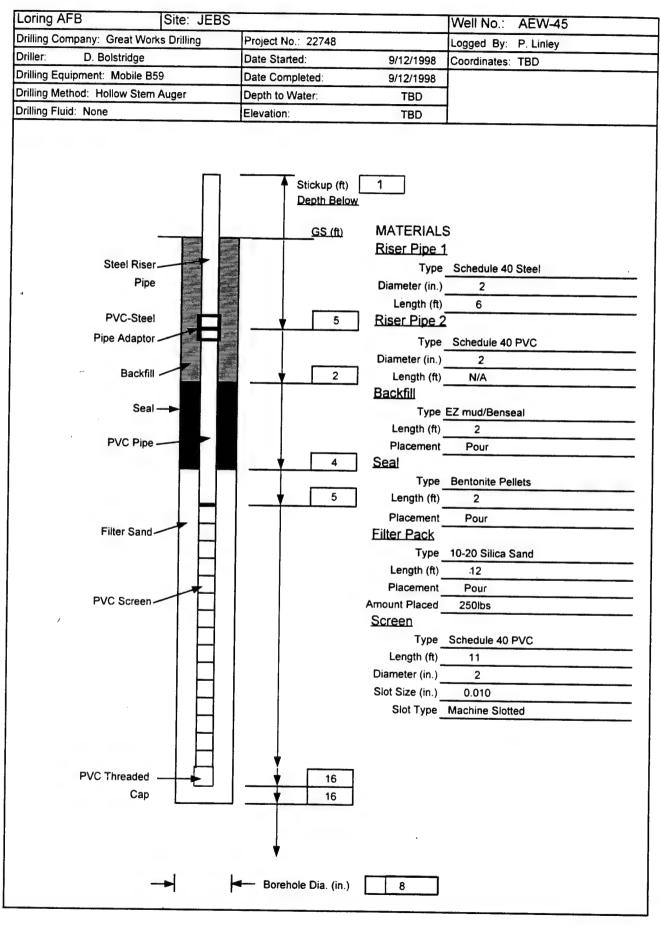
Projec	et Name: Loring AFB	1			Porchale No : AFIM 40
	et Number: 22784	Elevati	ion:	TBD	Borehole No.: AEW-43
	Location: JEBS			2/98	Data Completed: 0/0/08
Driller	: Great Works Drilling		epth (ft)		Date Completed: 9/2/98 21
	ment: Mobile B59		to Bedro		
	g Method: Hollow Stem Auger		iameter		
	g Fluid: None		to Water		8 TBD
	letion: Completed as a Soil Vapor Extraction Well		By: P.		TBD
	See Construction Log for details	Logget	г	Lilley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
-	0-21ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required to be
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
_	poorly sorted, subang to subrd.				
5	-				
~-	-				
-	=				
_	·· -				
_				ł	
10	-		ĺ		·
_	_ ·			ļ	
	4		-		
	┥		]		
	. +		İ		
15	+	1			
	<u>,</u> .		İ		
	· · · · · · · · · · · · · · · · · ·	ĺ	Í		
	7	ĺ		-	
	<u> </u>		}		
20	,				
	21ft: Bedrock: Limestone.		- 1		
_				- 1	ĺ
4	]			İ	i
25			1		
25		ł	ł		
		1	ŀ		
$\dashv$		- }			
$\dashv$	_		ĺ	- 1	
30					
	4				
$\dashv$	· 4				
-	4				
$\dashv$	4				İ



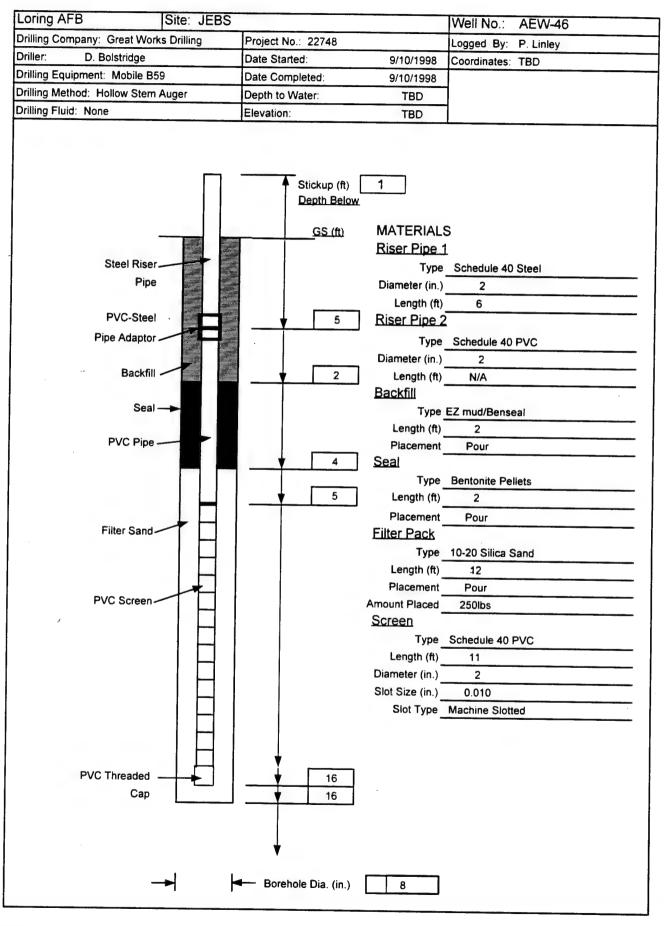
Projec	et Name: Loring AFB	T			Borehole No.: AEW-44
	et Number: 22784	Elevati	on.	TBD	DOI ETIOLE TVO AEVV-44
	on: JEBS		tarted:9/		Date Completed: 9/9/98
Driller	: Great Works Drilling		epth (ft)		19.5
	ment: Mobile B59		o Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		18
Comp	letion: Completed as a Soil Vapor Extraction Well		By: P.		
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-0.25ft: Asphalt				No samples required to be
-	0.25-0.75ft: Fill - Gravel				collected during installation
-	0.75-19.5ft: Gravelly clayey silt: (ML), Lt olive				
5	gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, poorly				
"-	sorted, unconsid, subang to subrd, moist.  3ft: Moist to v moist.				
-	Site Worst to V moist.				
-	-				·
-	-				
10	-				
' -	-				
-	-				
-	· <b>-</b>				
	7				
15	]				
	7				
_	7				
	18ft: Wet - soupy cuttings.			_	
l	19.5ft: Bedrock: Limestone.				
20_					
_					
_					
				1	
25-	_		ĺ		
25_			J		
_	_				
_	_	.			
_					,
30	4				
~~	-		1	Ì	
_	4				
		ı		ļ	
	4		I		



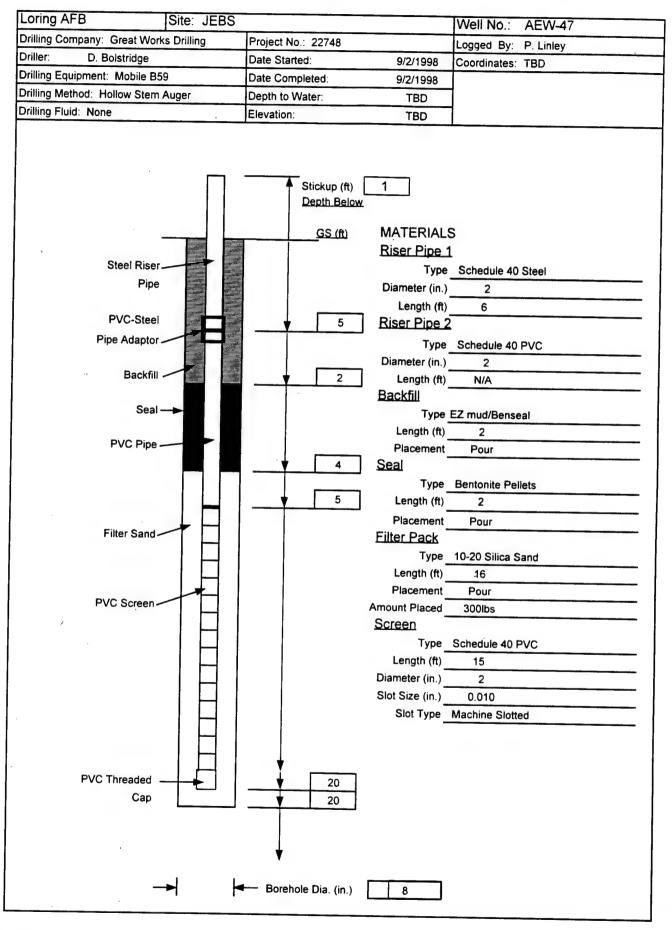
Projec	t Name: Loring AFB				Parahala No : AEIA/ 45	
Project Number: 22784		Borehole No.: AEW-45 Elevation: TBD				
Location: JEBS		Date Started:9/12/98 Date Completed: 9/12/98				
Driller: Great Works Drilling		Total Depth (ft): 16				
		Depth to Bedrock (ft):				
Drilling	Method: Hollow Stem Auger				8	
Drilling	r Fluid: None	Depth to Water (ft):			TBD	
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
-	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be	
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
-	poorly sorted, subang to subrd.					
5	_					
-						
_	-					
	· -					
	│					
10	7					
	┪					
	1	ľ				
			j	ĺ		
15	]	- 1				
15	46% Padasalu II	1	ĺ		ļ	
	16ft: Bedrock: Limestone.					
_	4	İ	- 1	.	]	
$\dashv$	4	l		ĺ		
20	4					
	′			İ	•	
	4		ļ			
	4		1			
	7		ĺ			
25	· · · •	1	ĺ			
4	_	ĺ				
4						
4	]	- 1				
30				j		
30						
-	4		. 1			
$\dashv$	4		]			
-	4					
i_						



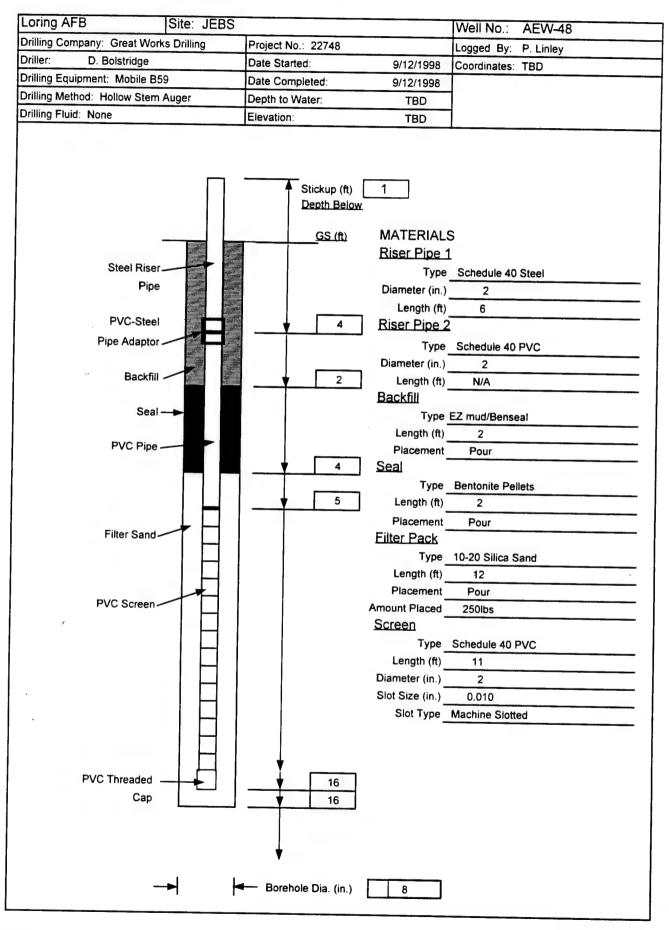
Proiec	et Name: Loring AFB				Doroholo No. ATIM 40	
Project Number: 22784		Borehole No.: AEW-46 Elevation: TBD				
Location: JEBS						
D. 11		Date Started:9/10/98 Date Completed: 9/10/98 Total Depth (ft): 16				
	Method: Hollow Stem Auger	Depth to Bedrock (ft)			8	
	g Fluid: None	Hole Diameter (in): Depth to Water (ft):				
	letion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley			TBD	
See Construction Log for details				Limey		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be	
] _	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation	
-	poorly sorted, subang to subrd.					
5	-					
~-	4					
-						
-	-					
_	-			ı		
10	-					
	-					
	<b>-</b>					
	4	ĺ		ŀ	·	
	-					
15				Í		
	16ft: Bedrock: Limestone.	Ī				
	=	ĺ				
	7		ĺ	.	•	
	7		1	Ī		
20	7					
	]		l			
_	]	ļ		1		
$\dashv$						
25			1			
23-	_		ĺ	l		
$\dashv$	_	-				
-	4	Ī				
$\dashv$	4		- 1			
30	4		ĺ	1		
	4		-			
$\dashv$	4	ļ	l			
$\dashv$	4					
$\dashv$	4		ľ			



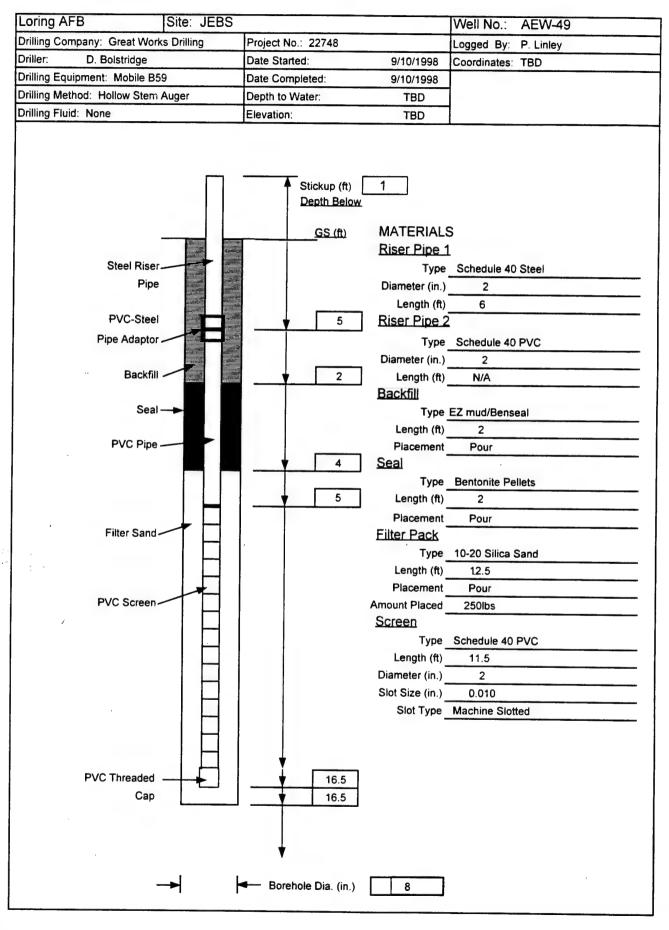
Projec	t Name: Loring AFB				Borehole No.: AEW-47
Project Number: 22784		Elevation: TBD			
		Date Started:9/2/98   Date Completed: 9/2/98			
		-	epth (ft).		20
	ment: Mobile B59		o Bedro		
Drilling	Method: Hollow Stem Auger	Hole Diameter (in):			. 8
	Fluid: None	Depth to Water (ft):			TBD
Compl	etion: Completed as a Soil Vapor Extraction Well	Logged By: P. Linley			
See Construction Log for details					
£				i i	
Depth (ft)	Description	e e	<u>a</u>	Blow Count	Comments
Tage		Sample Number	E B	3	Comments
۵		Sa Nu	Sample Type	BE	
_	0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required to be
_	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				collected during installation
	poorly sorted, subang to subrd, moist.				
	·				
5_	_				
_	7.7.5% 0.111				
-	7-7.5ft: Cobble zone.				
l –	_	,			·
10	. 4				-
'0-	_				
_	-	٠			
_	<del>.</del>				
-	-				
15	-				
'`-	-				
_	-				
_	-	· ·		-	
_	- · · · ·				
20	20ft: Bedrock: Limestone.				
	· ·				ĺ
		1			
	+	İ			
	·	}			
25	4				
	· • • • • • • • • • • • • • • • • • • •		İ	1	
	7	j			
	7				
30		l			
	₹	Ì			
	· 1		l		
	. 1		Ì		



Projec	t Name: Loring AFB	Ī			Borehole No.: AEW-48	
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started:9/12/98   Date Completed: 9/12/98				
		Total Depth (ft): 16				
	ment: Mobile B59	Depth t	Depth to Bedrock (ft): 16			
	Method: Hollow Stem Auger	Hole Diameter (in): 8			8	
	Fluid: None	Depth to Water (ft):			TBD	
Compi	letion: Completed as a Soil Vapor Extraction Well See Construction Log for details	Logged	I By: P.	Linley		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
10	0-16ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.	S	SS T		No samples required to be collected during installation	
30	- - - - - -					

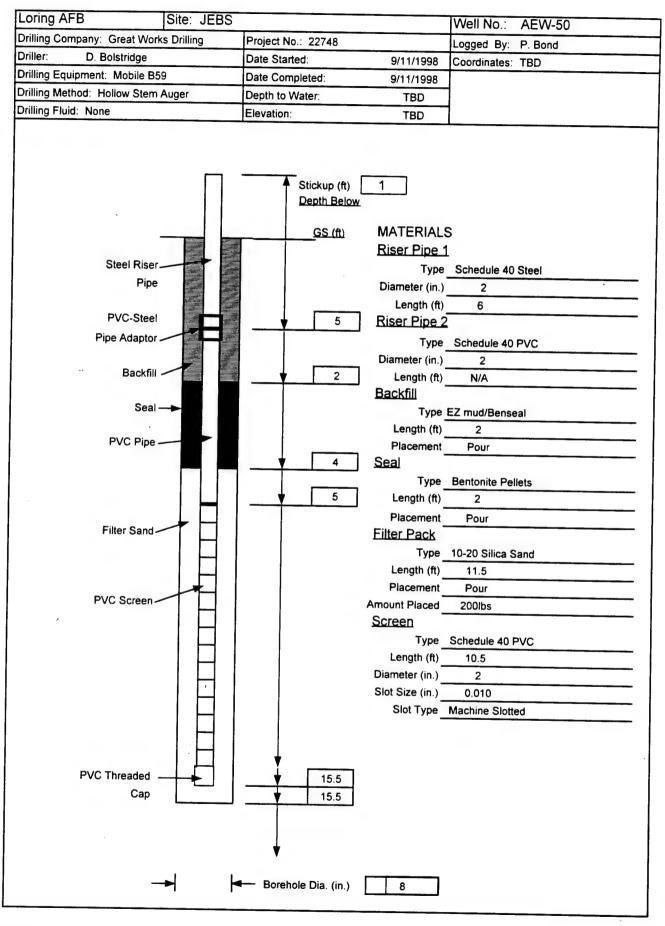


Proje	ct Name: Loring AFB		-		Borehole No.: AEW-49	
Project Number: 22784		Elevation: TBD				
Location: JEBS		Date Started:9/10/98   Date Completed: 9/10/98				
Driller: Great Works Drilling					16.5	
Equipment: Mobile B59		Depth to Bedrock (ft)				
Drillin	g Method: Hollow Stem Auger	Hole Diameter (in):			8	
Drillin	g Fluid: None	Depth to Water (ft):			3	
Comp	oletion: Completed as Soil Vapor Extraction Well	Logged By: P. Linley				
	See Construction Log for details			,		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments	
_	0-10ft: Fill - Gravel: Moist.				No samples required to be	
-		]			collected during installation	
-	3ft: Wet.	l				
5	-					
~-	-		}		,	
-	<del>-</del>					
-	-					
_	· 0-					
10	10-16.5ft: Gravelly Clayey Silt: (ML), Lt olive gry				•	
-	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid					
	poorly sorted, subang to subrd.			]		
_	- Subline to Subline					
_	-					
15	<b>-</b>					
-	16.5ft: Bedrock: Limestone.			l		
	- Linicolone		]			
-	1			-		
_	1 · · · ·			- 1		
20	<u> </u>					
	′					
	1					
	-					
_				İ		
25				l		
	-	ĺ		ĺ		
		l				
		ł	- 1			
30	1	.				
	<b>-</b>		ł			
	·					
		-	I	- 1		
	·					



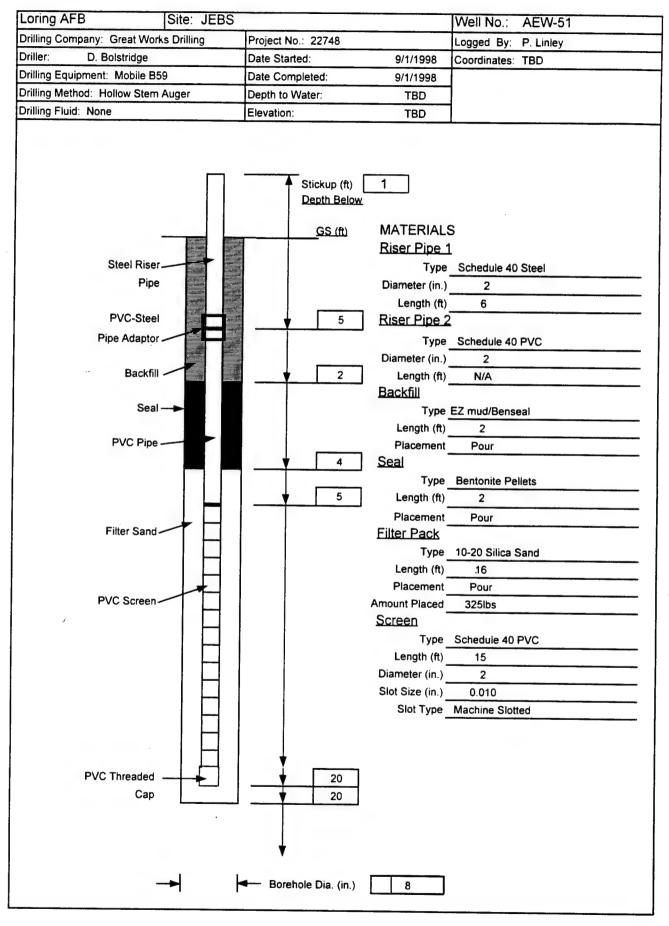
Projec	ot Name: Loring AFB	T	<del></del>		Dorohala No. AFIN FO
Project Number: 22784		Borehole No.: AEW-50 Elevation: TBD			
Location: JEBS		Date Started:9/11/98 Date Completed: 9/11/98			
Driller: Great Works Drilling		Total Danth (#)			
Equipment: Mobile B59		Total Depth (ft):			15.5
Drilling Method: Hollow Stem Auger		Depth to Bedrock (ft)			
	g Fluid: None	Hole Diameter (in):			8 TDD
	letion: Completed as Soil Vapor Extraction Well	Depth to Water (ft): Logged By: P. Bond			TBD
	See Construction Log for details	Logged	г Бу. г.	Bona	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-15.5ft: Gravelly silty clay w/sand: (ML), Lt		1.		No samples required to be
-	olive brn (5Y5/6), gravels to 4cm, mostly rounded				collected during installation
10 1 20 1	15.5ft: Bedrock: Limestone.		-		
25					·

## SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG



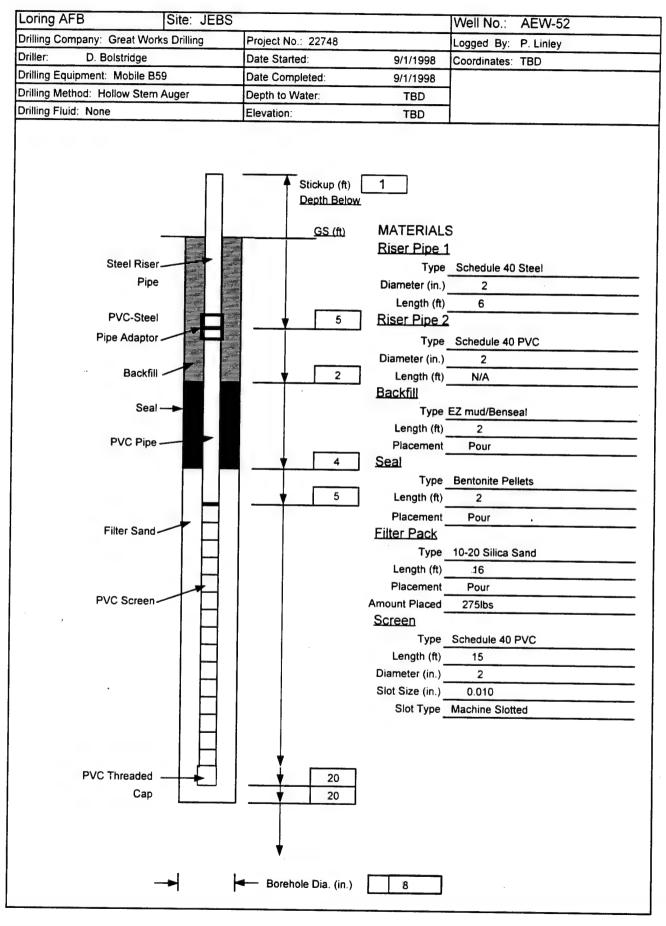
Projec	et Name: Loring AFB				Borehole No.: AEW-51
	et Number: 22784	Elevati	on:	TBD	DOI ONO INC. PALVE
-	on: JEBS	Date S	tarted:9/		Date Completed: 9/1/98
	Great Works Drilling	Total D	epth (ft)	:	20
	ment: Mobile B59	Depth	to Bedro	ck (ft):	20
	g Method: Hollow Stem Auger	Hole D	iameter	(in):	8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as Soil Vapor Extraction Well	Logged	By: P.	Linley	
	See Construction Log for details			1	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
	0-20ft: Gravelly clayey silt: (ML), Lt olive gry	° -	0, 1		No samples required to be
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	1		}	collected during installation
_	poorly sorted, subang to subrd.				
		]			
5_	06. 34. 1	1			
-	6ft: Moist.	-			
-	  8ft: V moist.	-	}		
_	Total V moist.	4			
10	-	-			
'-	-	1			
-	-	1			
_	-	1			
	-	1			
15_	-	1			
	-	1			
_		]			
				-	
	20ft: Bodrooks Limoston				
20_	20ft: Bedrock: Limestone.	ļ			
_	_			:	
-	-				
-	<del>.</del>				
25					
	-				
	-				İ
_	-				
_	<del>-</del>				
30	_				
	-			ļ	
	_		ĺ		
	_				

## SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG

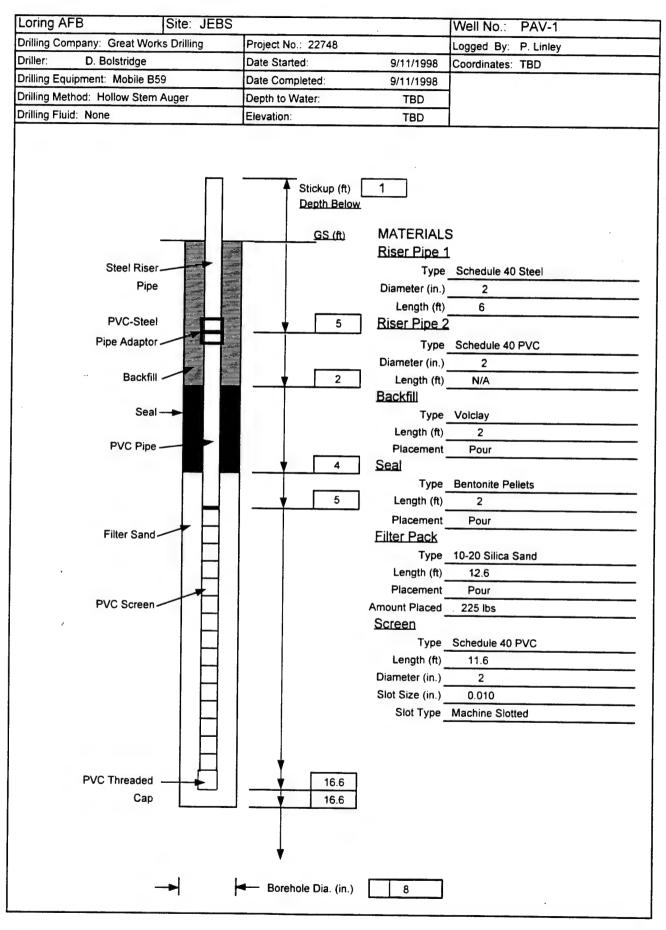


Projec	et Name: Loring AFB	I			Borehole No.: AEW-52
	et Number: 22784	Elevati	on:	TBD	Dorenole No.: AEVV-32
Locati	on: JEBS		tarted:9/	_	Date Completed: 9/1/98
Driller.	Great Works Drilling		epth (ft)		20
	ment: Mobile B59		o Bedro		
	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		TBD
Comp	letion: Completed as Soil Vapor Extraction Well		By: P.		
	See Construction Log for details				·
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-20ft: Gravelly silty clay w/sand: (ML), Lt				No samples required to be
_	olive brn (5Y5/6), gravels to 4cm, mostly rounded				collected during installation
-	edges. 4-6ft: Cobble zone.				
5	14-ort. Cobble Zorie.				
~-	4				,
_	· -				
_	8-8.5ft: Cobble zone.				
10_		,			
_	_				
_	_				
	4	ĺ			
15	_				
'~ <b>-</b>	<u>.                                      </u>	. ]		i	
-	4				
	-			. [	
$\dashv$	4				
20	20ft: Bedrock: Limestone.		·		
$\dashv$	,				
	4	ĺ			
25	4	ŀ	l		
	4		ĺ		
$\dashv$	·			İ	i
$\neg$	·				
$\dashv$	4			- 1	
30	4				
$\dashv$	4			1	
	· –				
٦	4				

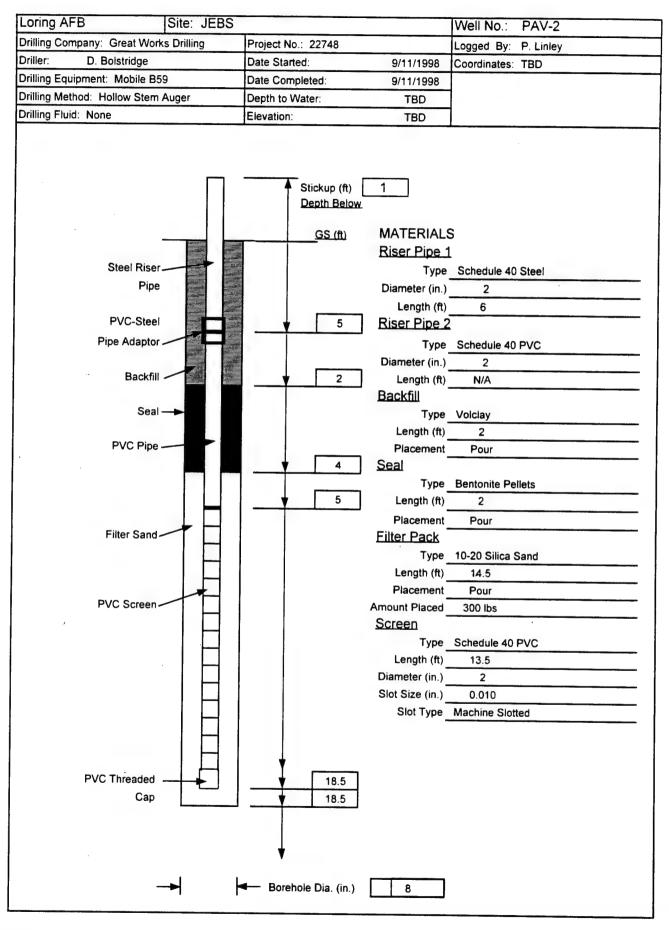
## SOIL VAPOR EXTRACTION WELL CONSTRUCTION LOG



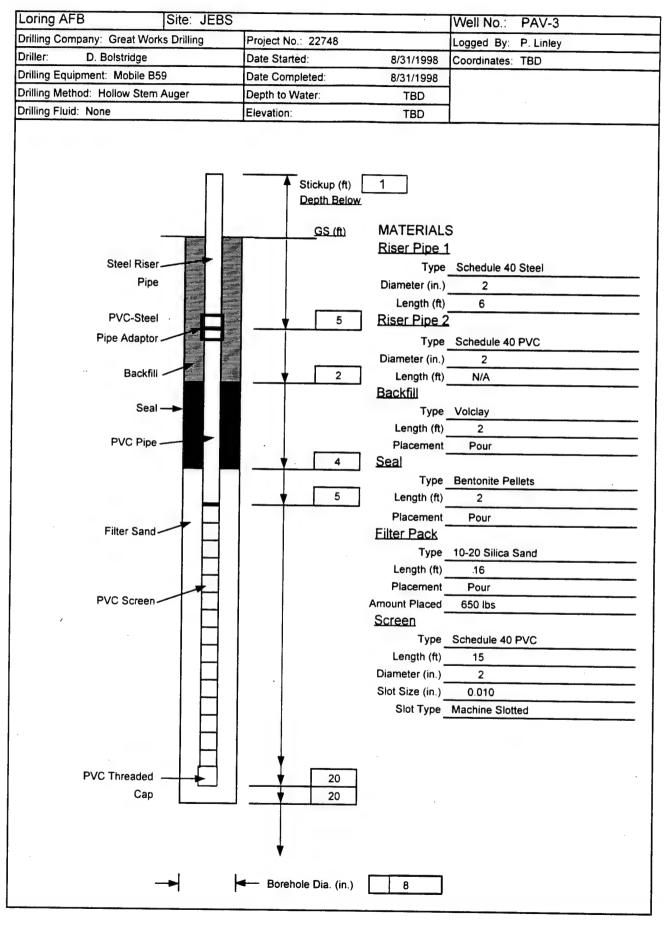
	ct Name: Loring AFB	1			Borehole No.: PAV-1
	ct Number: 22784	Elevation: TBD			
	on: JEBS	Date Started:9/11/98   Date Completed:			Date Completed: 9/11/98
	: Great Works Drilling				15.6
Equipi	ment: Mobile B59		to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as a Passive Air Vent		By: P.		
	See Construction Log for details	33			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 1 20 1 30 1 30 1	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-15.6ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd.				No samples required for collection. Auger refusal at 3ft BGL, relocated approx. 3ft south southeast of original location.



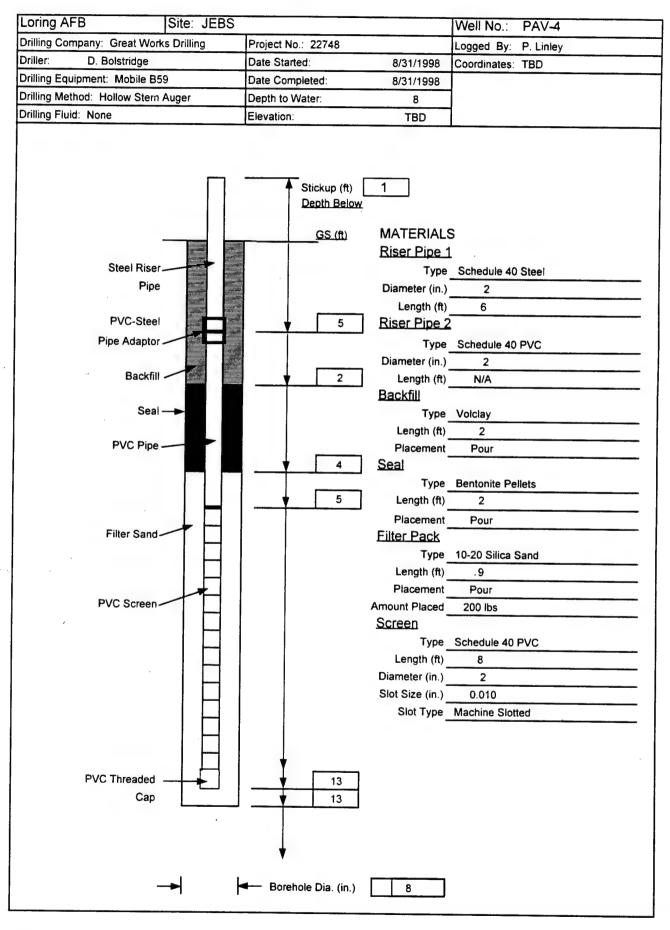
Projec	ct Name: Loring AFB	T			Borehole No.: PAV-2
	ot Number: 22784	Elevat	ion <sup>.</sup>	TBD	Borenole No PAV-2
Locati	ion: JEBS				Date Completed: 9/11/98
Driller	: Great Works Drilling	Total L	Depth (ft)	,, 00	18.5
	ment: Mobile B59		to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as a Passive Air Vent		d By: P.		
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd.		S .		No samples required for collection.



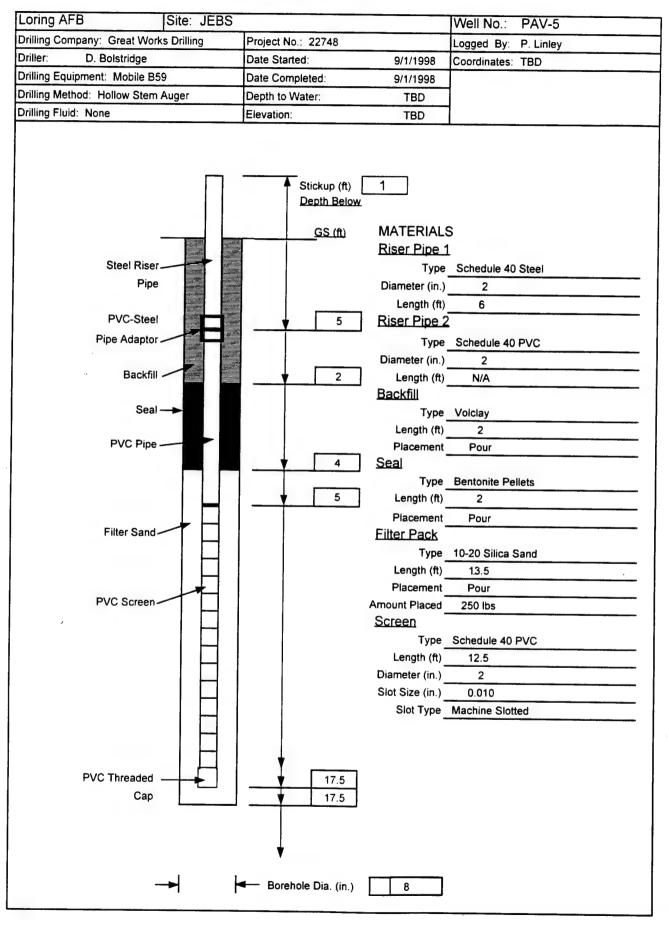
Description   Project Number: 22784   Elevation: TBD   Date Started:8/31/98   Date Completed: 8/3   Date Com	Proje	ct Name: Loring AFB			•	Porchala Na : DAV 2
Detail Popular   Deta			Borehole No.: PAV			Iborellole No.: PAV-3
Total Depth (ft): 20	Locat	ion: JEBS				Date Completed: 9/21/09
Equipment: Mobile B59   Depth to Bedrock (ft): 20   Drilling Method: Hollow Stem Auger   Hole Diameter (in): 8   Equipment: Mobile Billing Method: Hollow Stem Auger   Hole Diameter (in): 8   Equipment: Mobile Billing Method: Hollow Stem Auger   Hole Diameter (in): 8   Equipment: Mobile Billing Method: Hollow Stem Auger   Depth to Water (ft): TBD   Depth to Water (ft):	Driller	: Great Works Drilling				
Drilling Huid: None   Depth to Water (in):   8   Depth to Water (in):   TBD						
Depth to Water (ft): TBD	Drillin	g Method: Hollow Stem Auger				
Completion: Completed as a Passive Air Vent   See Construction Log for details   Logged By: P. Linley	Drillin	g Fluid: None				
Description  Descr	Comp	letion: Completed as a Passive Air Vent				
0-20ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-5 inches in diameter.  8ft: Clay fraction increase to 20%. 9ft: Clay fraction decrease to 10%.  18ft: Clay fraction increase to 20%, moist to v moist. 20 20ft: Bedrock: Limestone.		See Construction Log for details		•	,	
No samples required collection.  No samples required collection.  No samples required collection.  No samples required collection.	Depth (ft)		Sample Number	Sample Type	Blow Count	Comments
30	10	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, gvl 4-5 inches in diameter.  8ft: Clay fraction increase to 20%. 9ft: Clay fraction decrease to 10%.	S	SS T	8	No samples required for collection.



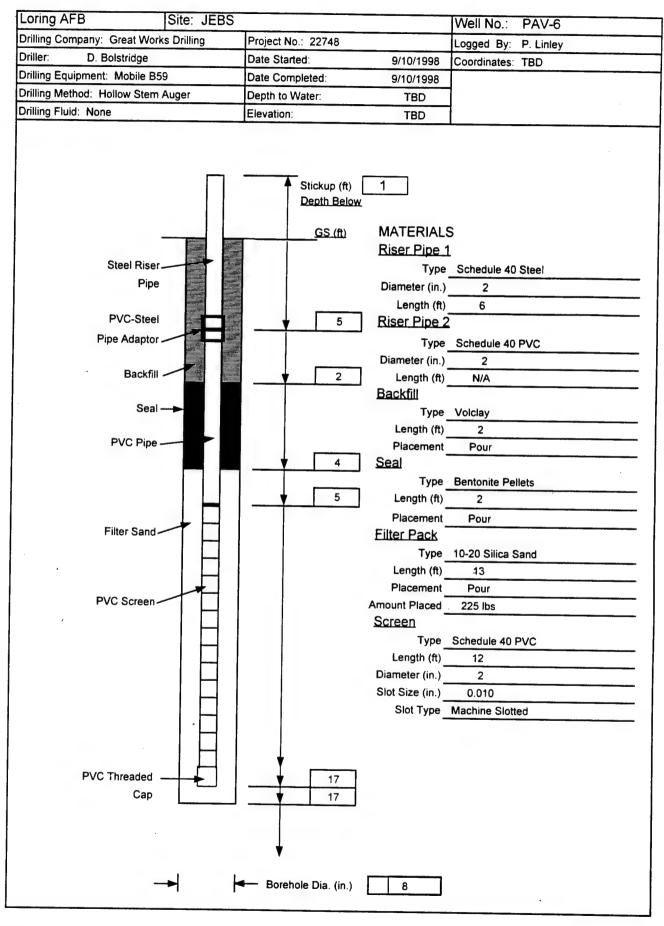
Projec	t Name: Loring AFB	<u> </u>			Borehole No.: PAV-4
	t Number: 22784	Elevation	on:	TBD	
	on: JEBS	Date S	tarted:8/	31/98	Date Completed: 8/31/98
	Great Works Drilling	Total D	epth (ft):		13
Equipr	ment: Mobile B59	Depth t	o Bedro	ck (ft):	13
Drilling	Method: Hollow Stem Auger	Hole Di	iameter (	(in):	8
	r Fluid: None	Depth t	o Water	(ft):	8
Compl	etion: Completed as a Passive Air Vent	Logged	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 15 1 20 1 30 1 30 1	0-13ft: <b>Gravelly Clayey Silt:</b> ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, grl to 3-4 inches in diameter.  6ft: V moist, cobble zone.  8ft: Wet - Soupy, septic oder.	S	S	-	No samples required for collection.
_	- -				



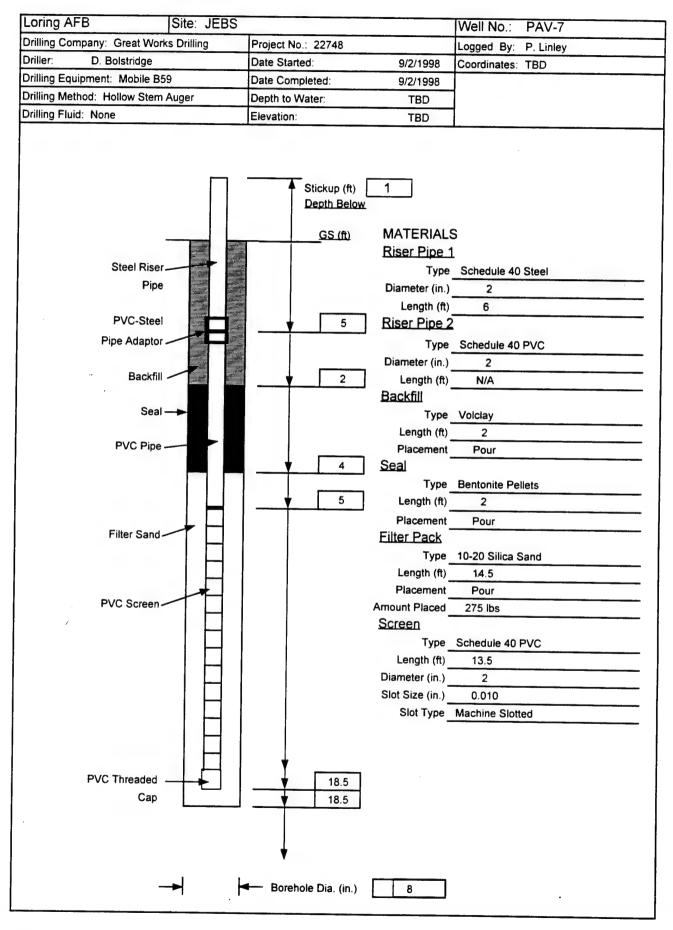
Proje	ct Name: Loring AFB		· · · · · · · · · · · · · · · · · · ·		:
	ct Number: 22784				Borehole No.: PAV-5
	ion: JEBS	Elevat		TBD	
	: Great Works Drilling	Date Started:9/1/98 Date Completed:			Date Completed: 9/1/98
	ment: Mobile B59	Total Depth (ft): 17.5			
			to Bedro		17.5
	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
Comp	letion: Completed as a Passive Air Vent	Logge	By: P.	Linley	
	See Construction Log for details				
			T		
læ			ľ	Blow Count	
Depth (ft)	Description	e e	<u>o</u>	ાં	6
ept		윤윤	E e	<u>``</u>	Comments
_ ق		Sample Number	Sample Type	Blo	
-	0-0.5ft: Concrete				No samples required for
_	0.5-1ft: Fill				collection.
_	1-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry		i i		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				
5_	poorly sorted, subang to subrd.				
				j	
_	1			J	
	7			·	
	· 1			l	
10	1				ĺ
_	┥		1	1	· .
_	┥	ĺ	ľ	.	
_	Ť	[			
	7	I			
15	7	- 1		- 1	
_			j	l	
	17.5ft: Bedrock: Limestone.		J		
	7		1	-	
	·	]	[		
20	7				
	- Table 1	1			
	7	ĺ		İ	İ
	. 7	i		1	
	7	ĺ		ĺ	ĺ
25	1	f	ł		
	· 1		l		
	4				
	-	- 1			
	4				
30	·			ł	
	4				
٦	_ +	-			
٦	4	• ]			
	4	.]	İ	ĺ	
					·



Projec	ct Name: Loring AFB	I			Borehole No.: PAV-6
	ot Number: 22784	Elevati	ion:	TBD	Dorenole No PAV-0
Locati	ion: JEBS				Date Completed: 9/10/98
Driller	: Great Works Drilling	Total D	epth (ft)		17
	ment: Mobile B59		to Bedro		
Drilling	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		to Water		TBD
	letion: Completed as a Passive Air Vent		By: P.		
	See Construction Log for details	Logge	. Dy. 1.	Liilley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
_	0-1ft: Concrete				No samples required for
-	1-2ft: Fill - Gravel				collection.
-	2-17ft: Gravelly Clayey Silt: (ML), Lt olive gry				
5	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid				
"-	poorly sorted, subang to subrd.				
-					
-	_				
-					i
10	-				·
''-	_				
_	_				Ì
_	4	ĺ		ĺ	
-	_				
15	-				
_	-			İ	ļ
—	17ft: Bedrock: Limestone.	i			
_				-	
		ļ	l		
20	· -	l	ĺ		1
	<i>'</i>				,
	+	1	ļ	İ	
	+	ĺ	ĺ		
	· –		i		1
25	Ť				
	┥				
	<b>–</b> – – – – – – – – – – – – – – – – – –				
	┪		1		
	. 🕇	ļ			
30	4		[		
	. 4	- [	1	- 1	
	7	ĺ			
	7	ł			



Projec	ct Name: Loring AFB				Borehole No.: PAV-7
	et Number: 22784	Elevati	on:	TBD	
	on: JEBS	Date S	tarted:9/	2/98	Date Completed: 9/2/98
	: Great Works Drilling		epth (ft)		18.5
	ment: Mobile B59	Depth t	o Bedro	ck (ft):	18.5
	g Method: Hollow Stem Auger		iameter		8
	g Fluid: None		o Water		TBD
Comp	letion: Completed as a Passive Air Vent	Logged	By: P.	Linley	
	See Construction Log for details				
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd, moist.		S .		No samples required for collection.



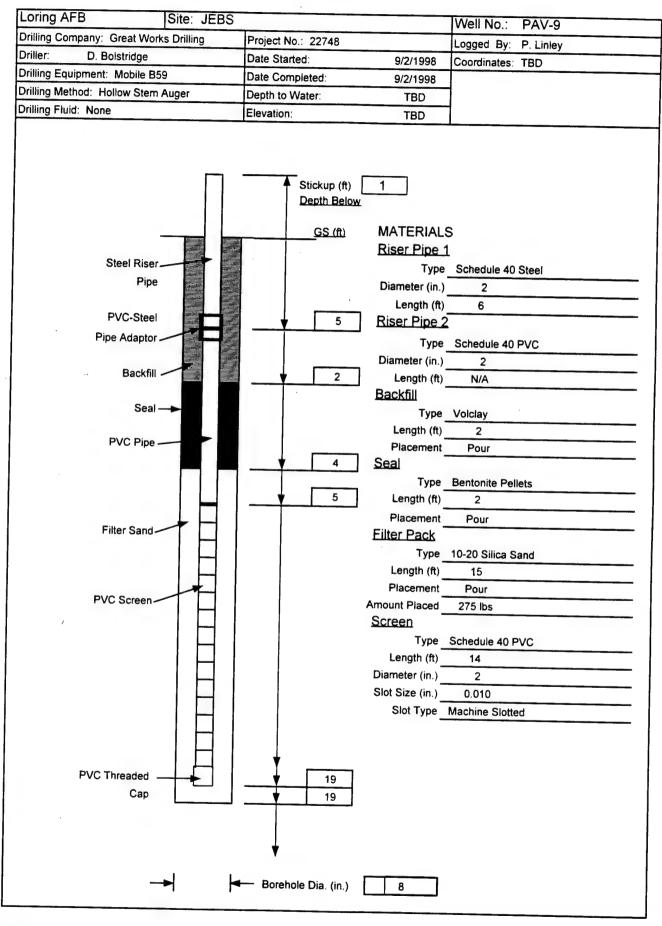
Projec	t Name: Loring AFB	T		b	Borehole No.: PAV-8
Projec	t Number: 22784	Elevati	on:	TBD	
Locati	on: JEBS	Date S	tarted:9/	2/98	Date Completed: 9/2/98
	Great Works Drilling	Total D	epth (ft).		17.5
	ment: Mobile B59		o Bedro		
	g Method: Hollow Stem Auger		Hole Diameter (in):		8
	g Fluid: None		o Water		TBD
Compi	letion: Completed as a Passive Air Vent See Construction Log for details	Logged	I By: P.	Linley	
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments
10 1 20 1 30 1 30 1 30 1 30 1 30 1 30 1	0-0.25ft: Asphalt 0.25-0.75ft: Fill - Gravel 0.75-17.5ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid, poorly sorted, subang to subrd.  7ft: moist.  17.5ft: Bedrock: Limestone.		5		No samples required for collection.

REQUEST	FOR IN	FORMAT	ON				
	(RFI)						
	, ,						
PROJECT NAME: AFCEE - Loring							
JOB NO. 22784-006		RFI NO:	292				
LOCATION: Limestone, Maine		PAGE	1	OF _	1		
TO: John Mueller		OF: AFCEE/ERB-L					
REFERENCE DRAWING: N/A	SPECIFIC	CATION:	N/A				
LOCATION: Jet Engine Buildup Shor	SVE Syst	em					
determined if necessary to do so. Frozen groupseal. Well performance, as measured by vacuum compared to data recorded at startup and during measured during frozen ground conditions (natural surface seal) will indicate if a well is short-circuiting will be provided with a area specific surface seal.  REASON REQUESTED:  Cost savings by significantly reduced to the seal of the s	and flow, wand after spall surface song to the su	will be recorde oring thaw. D eal) and unfro urface. Wells	ifferences in we ozen ground cor that indicate sh	eriod and Ill performan nditions (no ort-circuiting	ce		
REPLY REQUIRED BY. 9/15/96							
9-Sep-98 DATE	OBMATIC		BEI CONTRACTOR				
	ORMATIC ONTRAC						
TO: Eric Berglund	FROM:	John Muell	er				
OF: BEI	OF:	AFCEE		* :			
REQUESTED INFORMATION: Approved per the attached email from AFBCA, De	enis St. Pet	er.					
9- /4- 98 DATE		ee/\langle	AFCEE/ERB-L	<u> QQ</u>	-		

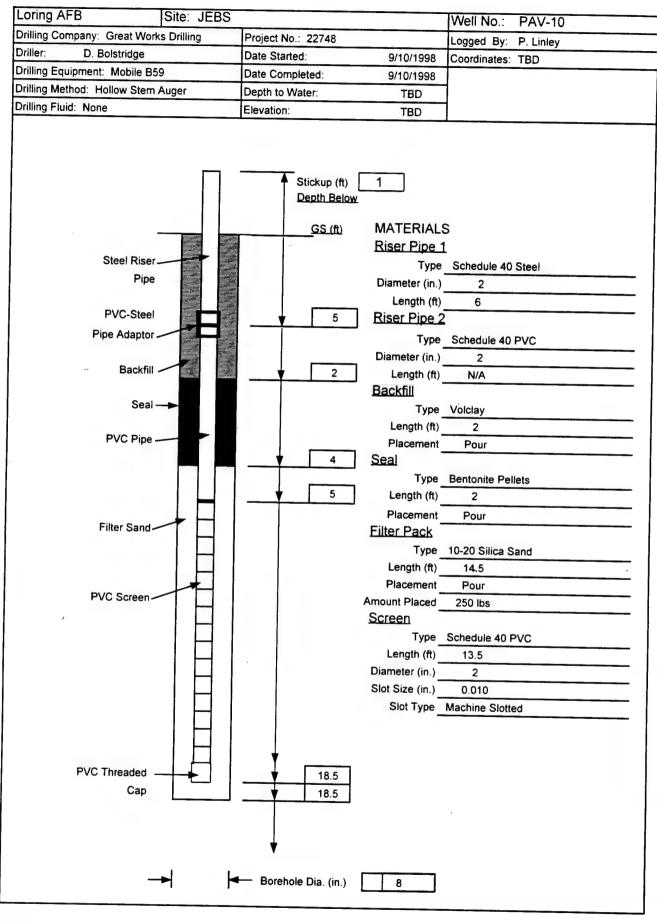
CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

Denis St. Peter

See Construction Log for details	fft): Irock (ft) er (in): ter (ft): P. Linley	Date Completed: 9/2/98
Location: JEBS       Date Started         Driller: Great Works Drilling       Total Depth         Equipment: Mobile B59       Depth to Bed         Drilling Method: Hollow Stem Auger       Hole Diamete         Drilling Fluid: None       Depth to Wat         Completion: Completed as a Passive Air Vent       Logged By:         See Construction Log for details	:9/2/98 (ft): Irock (ft) er (in): er (ft): P. Linley	Date Completed: 9/2/98  19 : 19 8 TBD Relocated approx. 1.5ft east of original location
Driller: Great Works Drilling  Equipment: Mobile B59  Depth to Bed Drilling Method: Hollow Stem Auger  Drilling Fluid: None  Completion: Completed as a Passive Air Vent See Construction Log for details  □  □  □  □  □  □  □  □  □  □  □  □  □	fft): Irock (ft) er (in): ter (ft): P. Linley	19 19 8 TBD Relocated approx. 1.5ft east of original location
Equipment: Mobile B59       Depth to Bed         Drilling Method: Hollow Stem Auger       Hole Diamete         Drilling Fluid: None       Depth to Wat         Completion: Completed as a Passive Air Vent See Construction Log for details       Logged By:	frock (ft) er (in): er (ft): P. Linley	: 19 8 TBD Relocated approx. 1.5ft east of original location
Drilling Method: Hollow Stem Auger       Hole Diamete         Drilling Fluid: None       Depth to Wal         Completion: Completed as a Passive Air Vent See Construction Log for details       Logged By:	er (in): ter (ft): P. Linley	8 TBD / Relocated approx. 1.5ft east of original location
Drilling Fluid: None  Completion: Completed as a Passive Air Vent See Construction Log for details  E  Depth to Wat Logged By:  □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	ter (ft): P. Linley	TBD  / Relocated approx. 1.5ft east of original location
Completion: Completed as a Passive Air Vent See Construction Log for details	P. Linley	Relocated approx. 1.5ft east of original location
See Construction Log for details		east of original location
Description eg	un t	
	Blow Count	Comments
0-19ft: Gravelly Clayey Silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd.  5  10  19ft: Bedrock: Limestone.	[8]	No samples required for collection.

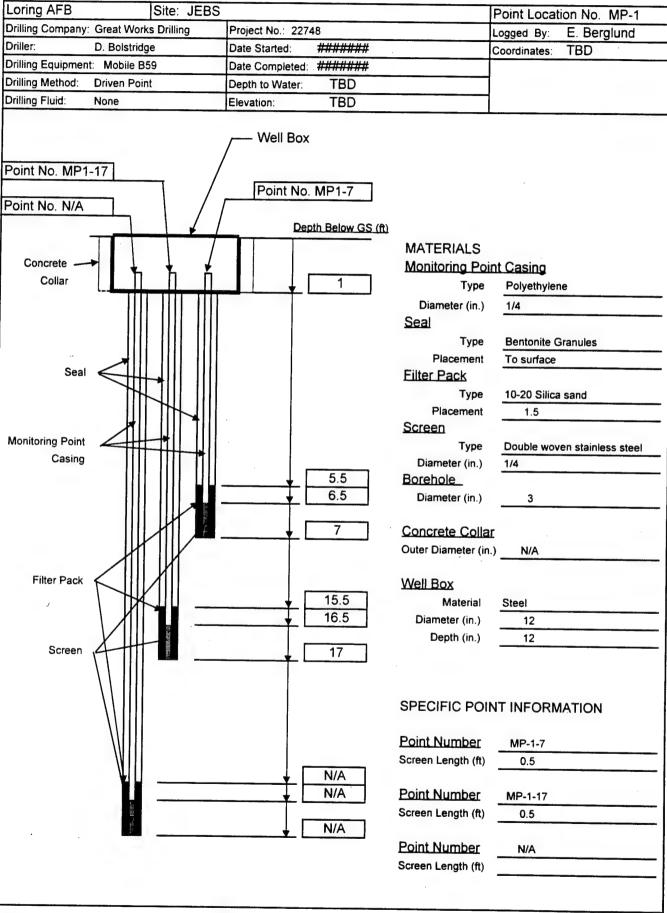


Proiec	t Name: Loring AFB				Borehole No.: PAV-10			
Project Number: 22784			Elevation: TBD					
Location: JEBS			Date Started:9/10/98 Date Completed: 9/10/98					
Driller:	Great Works Drilling		epth (ft).		18.5			
Equipi	ment: Mobile B59		o Bedro					
Drilling	Method: Hollow Stem Auger		iameter	• • •	8			
Drilling	Fluid: None		o Water		TBD			
Compl	etion: Completed as a Passive Air Vent		By: P.					
	See Construction Log for details							
				ınt				
Depth (ft)	Description	வ ந்	w	Blow Count	0			
# <u>a</u>	Description	혈환	d a	`≱	Comments			
De		Sample Number	Sample Type	읆				
	0-18.5ft: Gravelly Clayey Silt: (ML), Lt olive gry				No samples required for			
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	-			collection.			
_	poorly sorted, subang to subrd, moist.							
_			,					
5_								
_	_							
<b> </b>								
_								
10-	· 🛁				·			
10_	4							
_	·							
-	_							
-	· -							
15	-				·			
'~-	-							
_	-							
_	18.5ft: Bedrock: Limestone.			-				
			,					
20				1				
	<b></b>							
~	†							
	7							
	7							
25								
	7							
	]		l					
30			Ì					
_	_							



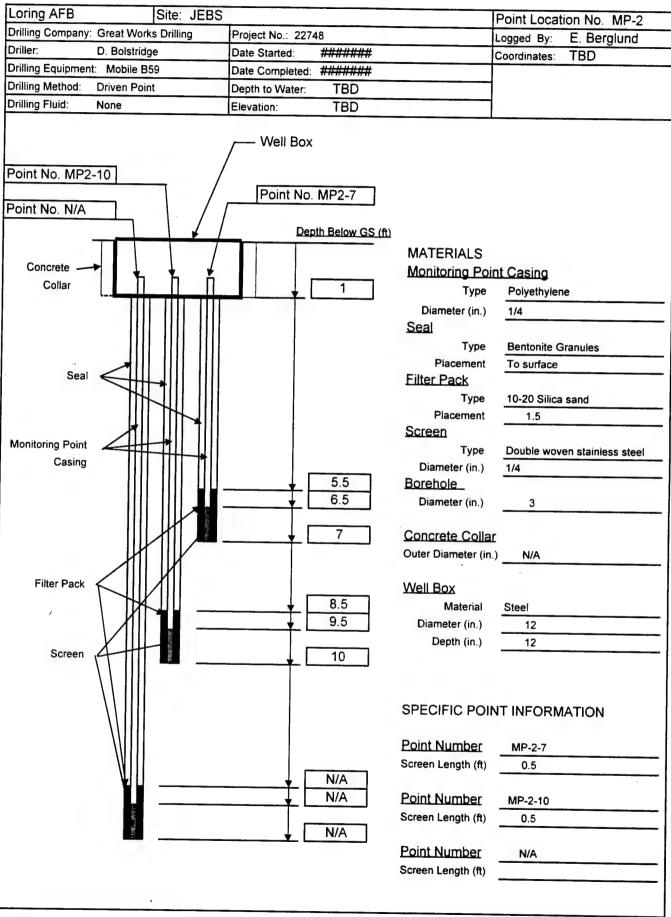
	ct Name: Loring AFB				Borehole No.: MP-1		
Project Number: 22784		Elevation: TBD					
	Location: JEBS		Date Started:9/11/98 Date Completed: 9/11/98				
	r: Great Works Drilling	Total Depth (ft): 17					
	ment: Mobile B59	Depth t	o Bedro	ck (ft).	None		
	g Method: Hollow Stem Auger		iameter		3		
	g Fluid: None		o Water		TBD		
Comp	oletion: Completed as SVE Monitoring Point	Logged	By: E.	Berglu	und		
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10	0-17ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.	S	S		No samples required.		

#### **SVE MONITORING POINT CONSTRUCTION LOG**



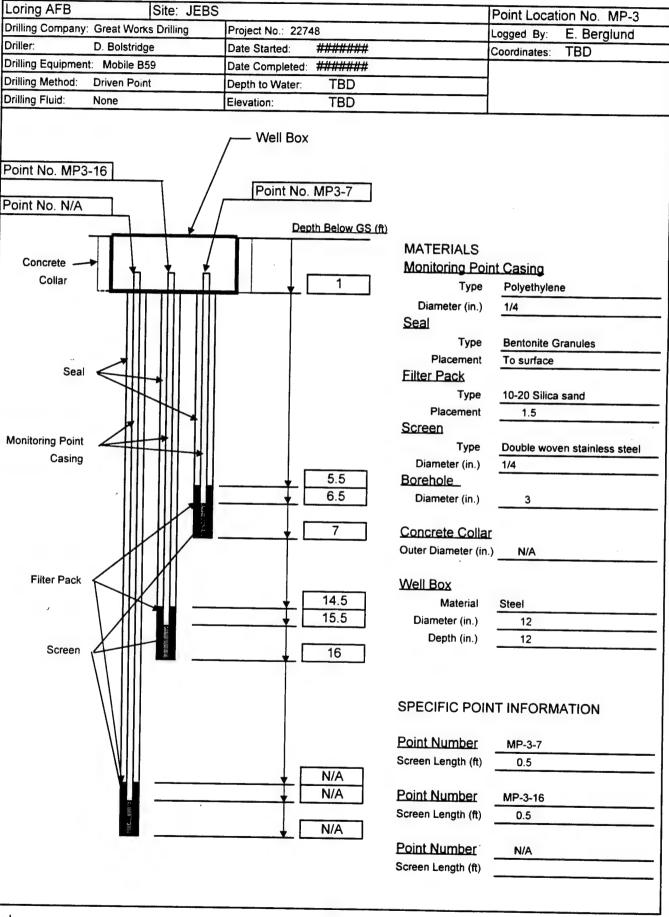
Projec	et Name: Loring AFB						
Project Number: 22784			on:	TOO	Borehole No.: MP-2		
Location: JEBS				TBD	IData Carrel to 1 001100		
	: Great Works Drilling	Total Depth (ft):			Date Completed: 9/11/98		
	ment: Mobile B59				10		
	g Method: Hollow Stem Auger		to Bedro				
	g Fluid: None		iameter		3		
	letion: Completed as SVE Monitoring Point		o Water		TBD		
	See Construction Log for details	Logged	By: E.	bergit	ima 		
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
10 1 15 1 20 1 30	0-10ft: <b>Gravelly clayey silt:</b> ( <i>ML</i> ), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsld poorly sorted, subang to subrd, moist.				No samples required.		
=	-						

## **SVE MONITORING POINT CONSTRUCTION LOG**



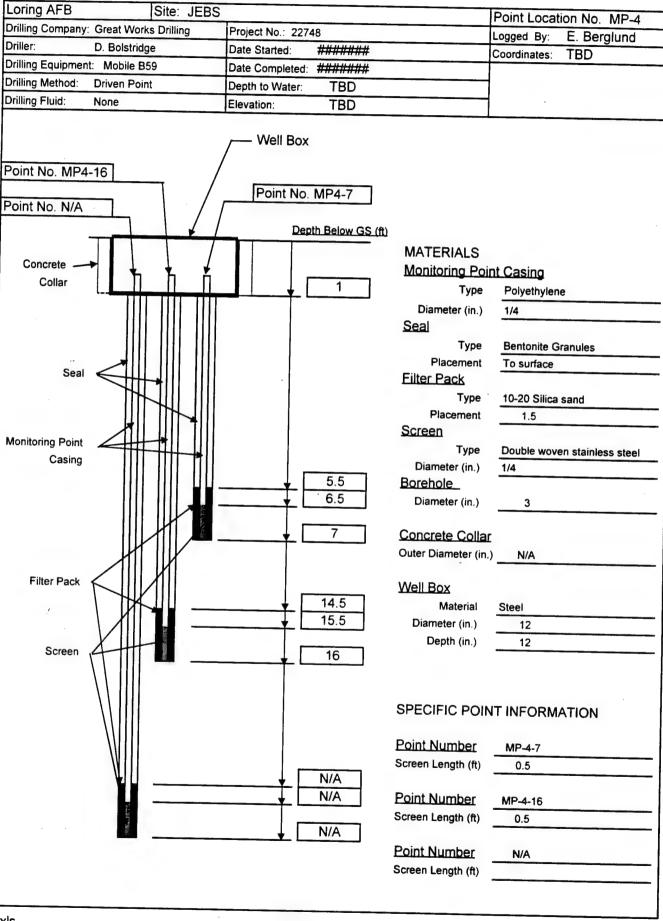
Elevation: TBD   Date Started: 9/11/98   Date Completed: 9/11/98   Date Completed: 9/11/98   Date Completed: 9/11/98   Date Completed: 9/11/98   Date Completed: 9/11/98   Total Depth (ft): 16   Equipment: Mobile B59   Depth to Bedrock (ft): None   Drilling Method: Hollow Stem Auger   Hole Diameter (in): 3   Depth to Water (ft): TBD   Depth t	Projec	et Name: Loring AFB				Borehole No.: MP-3			
Location: JEBS   Date Started:9/11/98   Date Completed: 9/11/98   Driller: Great Works Drilling   Total Depth (ft): 16   Equipment: Mobile B59   Depth to Bedrock (ft): None   Drilling Method: Hollow Stem Auger   Hole Diameter (in): 3   Drilling Fluid: None   Depth to Water (ft): TBD	Project Number: 22784								
Driller's Great Works Drilling   Total Depth (ft): None	Locati								
Equipment: Mobile B59  Depth to Bedrock (ft): None  Drilling Method: Hollow Stem Auger  Hole Diamster (in): 3  Depth to Water (ft): TBD  Completion: Completed as SVE Monitoring Point See Construction Log for details  Description  Depth to Water (ft): TBD  Comments  Description  Description  Description  Description  Description  Depth to Water (ft): TBD  Comments  Description  D	Driller	: Great Works Drilling	Total D	epth (ft)	:				
Drilling Method: Hollow Stem Auger   Hole Diameter (in): 3   Drilling Fluid: None   Depth to Water (ft): TBD	Equip	ment: Mobile B59							
Description   Description	Drilling	g Method: Hollow Stem Auger							
Completion: Completed as SVE Monitoring Point See Construction Log for details  Description  O-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.  To 0 10 10 10 10 10 10 10 10 10 10 10 10 1									
See Construction Log for details  Description  O-16ft: Gravelly clayey sitt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y6/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.  No samples required.									
Description  Descr			Logged	. Бу. С.	Dergi	ina I			
0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.  10  15  20  25  25		· · · · · · · · · · · · · · · · · · ·							
0-16ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.  10  15  20  25  25	Depth (ft)	Description	ample umber	ample ype	low Count	Comments			
(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconstd poorly sorted, subang to subrd, moist.  5  10  20  25  25		0-16ft Gravelly clavey silt: (M/) It alive and	υZ	S F	B				
poorly sorted, subang to subrd, moist.  10  10  20  25  25	-	(5Y6/1) to clive any (5Y4/4) when the first war in				No samples required.			
10	-	noorly sorted subang to suband assist							
10	-	Subtraction of the subtraction o							
10	5	-							
20	-	-		ĺ					
20	_	_							
20	-	1				1			
20	_	-							
20	10-	. <b>_</b>							
20	· · · ·	4							
20	_								
20	_								
20	_								
20	15	·							
25	'~								
25	-	_	-						
25	$\dashv$	·	- 1		_				
25	-	_		İ					
25	20-	4							
	2°-								
	$\dashv$		ŀ						
	$\dashv$	4							
	25	4							
30	20_								
30	$\dashv$	_			j	İ			
30	$\dashv$			ļ					
30	$\dashv$								
	30-		- 1		ĺ				
	30	ال	]						
	4	]		-					
-	4	]	- 1						
	$\dashv$	· .							

#### **SVE MONITORING POINT CONSTRUCTION LOG**



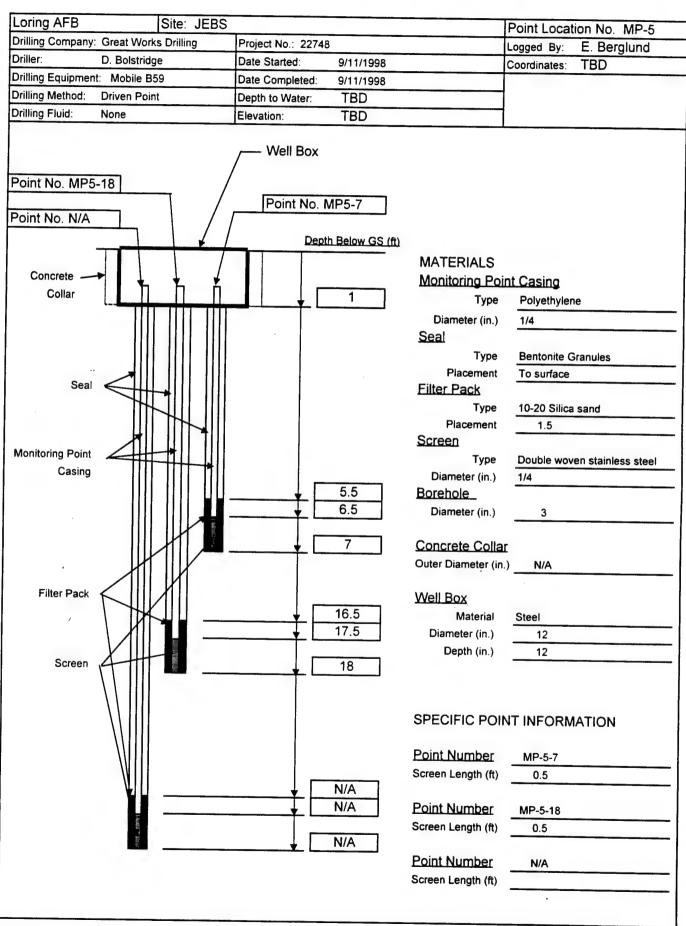
Projec	t Name: Loring AFB			Borehole No.: MP-4			
Project Number: 22784			Elevation: TBD				
	on: JEBS	Date Started:9/11/98 Date Completed: 9/11/98					
	Great Works Drilling	Total Depth (ft): 16					
	ment: Mobile B59	Depth t	o Bedro	ck (ft).	None		
	g Method: Hollow Stem Auger	Hole Diameter (in): 3					
	g Fluid: None		o Water		TBD		
Compl	letion: Completed as SVE Monitoring Point	Logged	By: E.	Berglu	ınd		
	See Construction Log for details						
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
	0-16ft: Gravelly clayey silt: (ML), Lt olive gry	0) 2	0)  -		No samples required.		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid	-					
_	poorly sorted, subang to subrd, moist.						
·							
5_	_						
-	 -						
-	-				·		
-	-	•					
10	<b>{</b>						
'-	┥						
-	-						
	i		·		•		
	]						
15	1				,		
	]	ŧ					
_	·						
_	_				·		
20-	-						
20	<i>!</i>						
-	· -						
-	4						
	-						
25	<b>–</b>						
	7						
	,						
30					·		
	]						
	]						
	· · ·						

## SVE MONITORING POINT CONSTRUCTION LOG



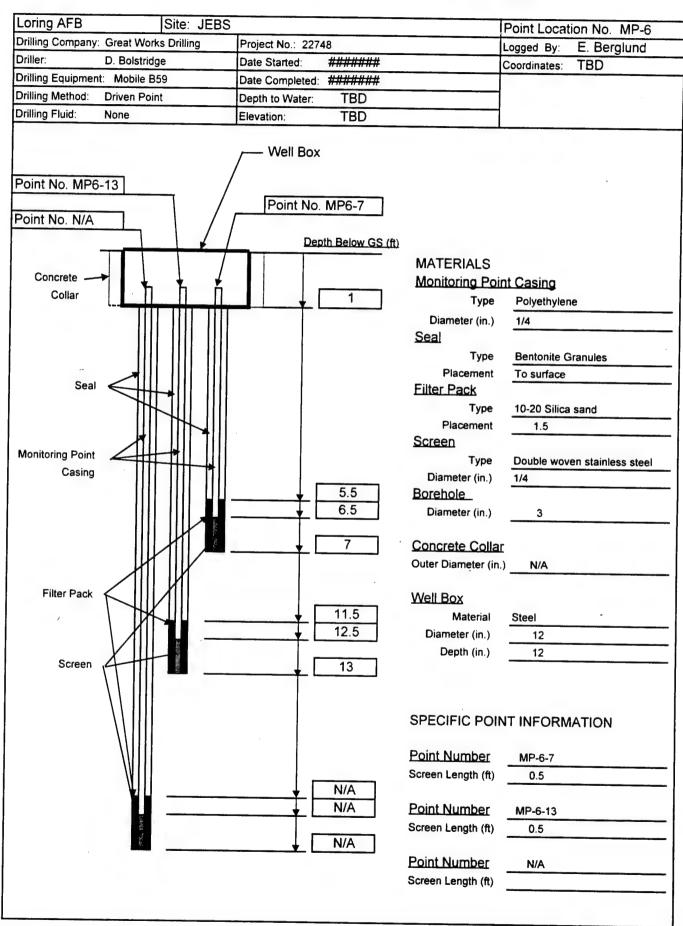
Projec	ct Name: Loring AFB	<u> </u>			Parahala Na : MD 5		
Project Number: 22784			Borehole No.: MP-5 Elevation: TBD				
Location: JEBS			Date Started:9/11/98 Date Completed: 9/11/98				
Driller	: Great Works Drilling	Total Depth (ft): 18					
	ment: Mobile B59	Depth to Bedrock (ft): None					
Drilling	g Method: Hollow Stem Auger		iameter		3		
Drilling	g Fluid: None		o Water		TBD		
Comp	letion: Completed as SVE Monitoring Point		By: E.				
	See Construction Log for details	33	- <b>,</b>	g			
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments		
-	0-18ft: Gravelly clayey silt: (ML), Lt olive gry				No samples required.		
	(5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid						
_	poorly sorted, subang to subrd, moist.						
5	_				·		
~-	_						
_	<b>-</b>						
-	-						
-	-				٠.		
10	-						
_	<b>-</b>						
-	-			İ			
_	-						
	7				1		
15	+		1				
	,				ł		
	7	i	]				
	7	l	ĺ	-			
	7	ŀ					
20	, · · · · · · · · · · · · · · · · · · ·	İ		- 1			
4	·						
_	]				1		
$\dashv$			.		1		
25		- 1	- 1				
2~⊢	4	İ					
$\dashv$	4		I				
-	4	- 1		- 1	-		
$\dashv$	4		l	- 1			
30	· -	- 1	1	-			
	4	ĺ	ļ	1			
$\dashv$	. 4			}			
$\dashv$	4						

#### SVE MONITORING POINT CONSTRUCTION LOG



Proje	ct Name: Loring AFB				Borehole No.: MP-6				
	Project Number: 22784			Elevation: TBD					
Location: JEBS			Date Started:9/11/98 Date Completed: 9/11/98						
	: Great Works Drilling	Total Depth (ft): 13							
	ment: Mobile B59	Depth i	to Bedro	ck (ft,	): None				
	g Method: Hollow Stem Auger	Hole D	iameter	(in):	3				
	g Fluid: None		o Water		TBD				
Comp	oletion: Completed as SVE Monitoring Point See Construction Log for details	Logged	By: E.	Bergi	lund :				
			I	T ==					
Depth (ft)	Description	Sample Number	Sample Type	Blow Count	Comments				
10 15 20 30 30 30 30 30 30 30 30 30 30 30 30 30	0-13ft: Gravelly clayey silt: (ML), Lt olive gry (5Y6/1) to olive gry (5Y4/1), v fine to fine, unconsid poorly sorted, subang to subrd, moist.	S) Z	S		No samples required.				

#### **SVE MONITORING POINT CONSTRUCTION LOG**



# APPENDIX C SVE EQUIPMENT INSPECTION



#### Interoffice Memorandum

o Distribution

File No.

Date

Subject

SVE Equipment Inspection - Air Components

October 19, 1998

From

David Wagner

DWM

Of

At

**AFCEE** 

Ext. 2190

Copies to

A site visit was conducted at Air Components (Grand Rapids, MI) to inspect the soil vapor extraction skid that will be installed at Loring Air Force Base. Del Stambach, of Air Components, was the contact that provided the inspection tour. The following is a summary of the visit/equipment inspection:

- The equipment was checked against the design figures and equipment cut sheets that had been previously provided as submittals. The equipment layout and material correlated to the information provided.
- 2. The Erdco flowmeter was found to be absent on the skid. The expected shipping date for this item is November 4, 1998. The skid can be operated without this item.
- 3. The equipment was operated to check for excessive noise/vibration, etc., and was found to operate satisfactorily.
- 4. The system vacuum was observed to be 0.5 psig with no resistance on the blower.
- 5. The system was tested at 12-in Hg and the motor amperage was observed to be 72 amps.
- 6. The level switches in the air/water separator were tested to ensure transfer pump operation. The switches and transfer pump operated as designed.
- 7. The control panel was visually inspected and found to be of professional construction.
- 8. The 250-gallon water storage tank was inspected and found to be a in vertical configuration. The tank is approximately 8-ft high, with a loading hook attached at the top.

In general, the equipment was found to be professionally designed and of quality construction. The only outstanding equipment issue is the lack of the Erdco flowmeters. The equipment is still operational without these items, and it is my recommendation that the equipment be shipped to the Loring site as soon as possible. The vendor thought that shipment on October 19-20 was a reasonable date.

# APPENDIX D REQUEST FOR INFORMATION No. 292

REQUEST FOR INFORMATION (RFI)								
PROJECT NAME: AFCEE - Loring								
JOB NO. 22784-006	RFI NO: 292							
LOCATION: Limestone, Maine	PAGE 1 OF 1							
TO: John Mueller	OF: AFCEE/ERB-L							
REFERENCE DRAWING: N/A	SPECIFICATION: N/A							
LOCATION: Jet Engine Buildup Sho	p SVE System							
seal. Well performance, as measured by vacuum compared to data recorded at startup and during measured during frozen ground conditions (natur surface seal) will indicate if a well is short-circuit will be provided with a area specific surface seal. REASON REQUESTED:	and during the winter season will provide a natural surface in and flow, will be recorded during this period and and after spring thaw. Differences in well performance ral surface seal) and unfrozen ground conditions (no ing to the surface. Wells that indicate short-circuiting sucing the total area of surface seal needed.							
REQUESTED BY: Eric Berglund	<b>—</b>							
REPLY REQUIRED BY: 9/15/98								
9-Sep-98 DATE	BEI CONTRACTOR FORMATION TO							
, , , , , , , , , , , , , , , , , , ,	CONTRACTOR							
TO:	FROM:							
OF:	OF:							
REQUESTED INFORMATION:								
DATE	AFCEE/ERB-L							

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dimbauer, Ed Trujillo

Denis St. Peter

#### Dub. Andrea

From:

dpeter@afbda1.hq.af.mil

Sent:

Wednesday, September 09, 1998 4:13 PM

To:

aadub@bechtel.com; John.Mueller@hgafcee.brooks.af.mil

Cc:

cadirnba@bechtel.com; extrujil@bechtel.com

Subject:

re: Open RFI's

Thanks for the reminder. I agree with the following RFIs:

RFI 288 - Approval to proceed excavating/stockpiling barrier soil from

misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3 per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

**VMB** 

RFI 292 - Approval to not install surface seal at JEBS

Original Text

From: "Dub, Andrea" <aadub@bechtel.com>, on 9/9/98 1:12 PM:

To: Denis St Peter@Loring@AFBDA.OLM

Denis, I think the RFI's listed below may belong to you. Could you advise s to the status and if they are not in your area, please advise as to whom I should contact. thank you - Andrea

RFI 288 - Approval to proceed excavating/stockpiling barrier soil

from misc areas for use on Landfill 3

RFI 289 - Approval to mix tub grinder by products and place in LF 3

per sediment placement plan

RFI 290 - Approval for revised area of excavation FTF, Bldg 8710 and

**VMB** 

RFI 292 - Approval to not install surface seal at JEBS

REQUEST	FOR IN	FORMATI	ON							
	(RFI)									
PROJECT NAME: AFCEE - Loring										
JOB NO. 22784-006		RFI NO:	292		Ċ					
LOCATION: Limestone, Maine		PAGE	1	OF .	1					
TO: John Mueller		OF: AFCE	E/ERB-L							
REFERENCE DRAWING: N/A	SPECIFIC	ATION:	N/A							
LOCATION: Jet Engine Buildup Shop	SVE Syste	em	-							
compared to data recorded at startup and during a measured during frozen ground conditions (natura surface seal) will indicate if a well is short-circuitin will be provided with a area specific surface seal. REASON REQUESTED:	REASON REQUESTED:  Cost savings by significantly reducing the total area of surface seal needed.  REQUESTED BY: Eric Berglund									
9-Sep-98			BEI							
DATE			CONTRACTOR	₹						
	ORMATIO ONTRACT									
TO: Eric Berglund	FROM:	John Mueli	or .							
TO. Elic bergiana	I KOWI.	John Muel	CI	•						
OF: BEI	OF:	AFCEE								
REQUESTED INFORMATION:	1									
Approved per the attached email from AFBCA, De	enis St. Pete	er.								
<u> ዓ -  /ዛ -                              </u>		-/(00	AFCEE/ERB-L		-					

CC: Dorothy Allen, Byron Best, Ken Barry, Carl Dirnbauer, Ed Trujillo

Denis St. Peter